

Highlights of the
**1988 Worldwide Survey
of Substance Abuse and Health Behaviors
Among Military Personnel**

Robert M. Bray
Mary Ellen Marsden
L. Lynn Guess
Sara C. Wheelless
Vincent G. Iannacchione
S. Randall Keesling

With assistance from:

Rose M. Etheridge
Charles D. Phillips
Judy A. Holley

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

2

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS JMC FILE COPY		
2a. SECURITY CLASSIFICATION			3. DISTRIBUTION / AVAILABILITY OF REPORT APPROVED FOR PUBLIC RELEASE. DISTRIBUTION UNLIMITED.		
2b.					
4. AD-A203 863			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION Research Triangle Institute		6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION Office of the Assistant Secretary of Defense (Health Affairs)		
6c. ADDRESS (City, State, and ZIP Code) Post Office Box 12194 Research Triangle Park, North Carolina 27709			7b. ADDRESS (City, State, and ZIP Code) OASD(HA)/PA&QA Room 3D360, Pentagon Washington, DC 20301		
8a. NAME OF FUNDING / SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER MDA903-87-C-0854		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO	PROJECT NO	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel Highlights Report					
12. PERSONAL AUTHOR(S) R.M. Bray, M.E. Marsden, L.L. Guess, S.C. Wheelless, V.G. Iannacchione, S.R. Keesling					
13a. TYPE OF REPORT Highlights		13b. TIME COVERED FROM 9/87 TO 1/89		14. DATE OF REPORT (Year, Month, Day) 1989 January 25	
15. PAGE COUNT 75					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Substance Abuse Tobacco AIDS		
			Alcohol Smoking Negative Effects		
			Drugs Health Behaviors Trends		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This report summarizes the results of the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel. Alcohol use, drug use, and cigarette use have declined significantly since 1980 and are now the lowest since the survey series began. The largest declines are for drug use. As alcohol use and drug use declined, the percentage of military personnel reporting alcohol- and drug-related negative effects also declined. The involvement of military personnel in selected health practices showed a small but significant increase between 1985 and 1988. Military policies and programs appear to be effective in creating an environment conducive to responsible alcohol use and nonuse of drugs.					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL M.R. PETERSON			22b. TELEPHONE (Include Area Code) (202) 695-7116		22c. OFFICE SYMBOL OASD(HA)/PA&QA

DTIC
ELECTE
3 JAN 198

Highlights of the

**1988 Worldwide Survey
of Substance Abuse and Health Behaviors
Among Military Personnel**

Robert M. Bray
Mary Ellen Marsden
L. Lynn Guess
Sara C. Wheelless
Vincent G. Iannacchione
S. Randall Keesling



With assistance from:

Rose M. Etheridge
Charles D. Phillips
Judy A. Holley

APPROVED FOR PUBLIC RELEASE.
DISTRIBUTION UNLIMITED.

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Avail and/or	
Dist	Special
A-1	

This report has been prepared for the Assistant Secretary of Defense (Health Affairs), under Contract Number MDA903-87-C-0854. The Research Triangle Institute (RTI) has been the contractor for this study with Robert M. Bray, Ph.D. serving as project director.

The views, opinions, and findings contained in this report are those of the authors and should not be construed as an official Department of Defense position, policy, or decision, unless so designated by other official documentation.

PREFACE AND ACKNOWLEDGEMENTS

The 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel was conducted by the Research Triangle Institute (RTI) under the sponsorship and guidance of the Assistant Secretary of Defense (Health Affairs). The survey is the fourth in a series of Worldwide Surveys conducted since 1980, and provides comprehensive and detailed estimates of the prevalence of use of alcohol, drugs, and tobacco and the negative consequences of alcohol and drug abuse among active-duty military personnel. The study also examines the prevalence of health behaviors and attitudes and knowledge about AIDS transmission and prevention.

Many individuals contributed to the success of this study. Among DoD and military Services personnel, special appreciation is due Air Force Lieutenant Colonel Michael R. Peterson, the Contracting Officer's Representative who provided valuable guidance throughout the study. Excellent liaison between DoD, RTI and the Services was provided by Lieutenant Colonel Samuel Holley for the Army, Commander Joseph Kavale for the Navy, Captain Kevin Sandri for the Marine Corps, and Major Mondo Dennett for the Air Force. The efforts of the four Service centers that provided programming and data processing support for personnel sample selection are gratefully acknowledged. The cooperation of installation commanders both for the pretest and the main survey, and the assistance and courtesies provided by the Military Liaison Officers who coordinated the activities of the data collection teams, were essential for the successful completion of this effort. Finally, appreciation is extended to the participating Service members whose responses made this study possible.

Under subcontract to RTI, James J. Tully and the staff of National Computer Systems assisted with the production and scoring of questionnaires. They printed, shipped, received, and optically scanned the survey questionnaires and constructed the raw data file for the analysis.

Many staff members of the Research Triangle Institute contributed significantly to the success of this project by composing the questionnaire, coordinating data collection activities, tabulating data, completing various data processing tasks, and typing of the manuscript. In particular, D. Kirk Pate provided assistance in data collection activities, and Gayle S. Bieler, Anne Carroll Theisen, and Jill Anderson assisted with data analysis, table production, and report preparation. George H. Dunteman provided helpful advice on multivariate analyses. J. Valley Rachal, Director of the Center for Social Research and Policy Analysis, provided direction, support, and encouragement throughout the project. Members of the RTI field teams are commended for accomplishing their data collection tasks under rigorous travel and scheduling demands. Finally, thanks are due Elizabeth R. Cavanaugh who edited the report and to Lillian W. Clark, R. Teresa Ferguson, and Donna J. Albrecht, who completed the enormous typing and clerical requirements.

Robert M. Bray, Ph.D.
Project Director

Table of Contents

<u>Chapter</u>	<u>Page</u>
1. BACKGROUND AND APPROACH.....	1
2. METHODOLOGY OF THE 1988 WORLDWIDE SURVEY.....	3
A. Sampling and Data Collection Procedures.....	3
B. Measurement Approaches.....	4
3. OVERVIEW OF TRENDS IN SUBSTANCE USE, NEGATIVE EFFECTS AND HEALTH BEHAVIORS.....	7
A. Trends in Prevalence of Substance Use.....	7
B. Trends in Negative Effects.....	9
C. Trends in Health Practices.....	11
4. ALCOHOL USE.....	13
A. Trends in Alcohol Consumption.....	13
B. Patterns and Correlates of Use.....	14
C. Alcohol Use and Military Job.....	16
5. DRUG USE.....	19
A. Trends in Drug Use.....	19
B. Prevalence of Use of Specific Drugs.....	20
C. Drug Use and Pay Grade.....	21
D. Correlates of Drug Use.....	24
6. TOBACCO USE.....	25
A. Trends in Cigarette Use.....	25
B. Cigarette Smoking and Pay Grade.....	27
C. Prevalence of Other Tobacco Use.....	28
D. Correlates of Smoking.....	29
E. Military Job and Smoking.....	29
F. Tobacco Use After the No Smoking Policy.....	29

TABLE OF CONTENTS (continued)

<u>Chapter</u>		<u>Page</u>
7.	NEGATIVE EFFECTS OF ALCOHOL AND DRUG USE.....	31
	A. Trends in Negative Effects of Alcohol Use.....	31
	B. Alcohol-related Negative Effects and Pay Grade.....	33
	C. Drinking Levels and Serious Consequences.....	35
	D. Trends in Negative Effects of Drug Use.....	35
	E. Drug-related Negative Effects and Pay Grade.....	37
	F. Drug Use Patterns and Serious Consequences.....	37
	G. Substance Use and General Negative Behaviors.....	38
8.	SUBSTANCE USE AND HEALTH.....	40
	A. Health Status and Health Practices.....	40
	B. Nutrition, Stress, and Hypertension.....	40
	C. Use of Alcohol, Drugs, and Cigarettes.....	41
	D. Relationship Between Substance Use and Health.....	42
9.	ATTITUDES TOWARD AIDS.....	43
	A. Beliefs About AIDS Transmission and Prevention.....	43
	B. AIDS Information Sources and Changes in Behavior with Awareness.....	43
10.	ALCOHOL AND DRUG ABUSE POLICIES AND PROGRAMS.....	46
	A. Beliefs about Effects of Alcohol and Drug Use Policies.....	46
	B. Treatment and Barriers to Seeking Help.....	46
	C. Urinalysis Testing Program.....	48
11.	HEALTH PROMOTION IN THE MILITARY: A SUMMARY.....	49
	A. Alcohol and Drug Abuse Prevention.....	49
	B. Smoking Prevention and Cessation.....	49
	C. Physical Fitness.....	50
	D. Nutrition.....	50
	E. Stress Management.....	50
	F. Hypertension Prevention.....	50
	G. AIDS Awareness.....	50
	References.....	53
	APPENDIX A - Supplementary Tables.....	A-1

List of Tables

<u>Number</u>		<u>Page</u>
1	Survey Respondents and Performance Rates.....	4
2	Sociodemographic Characteristics of Eligible Respondent Population.....	5
3	Substance Use and Health Summary, 1980-88 - Total DoD.....	8
4	Nonmedical Drug Use During the Past 30 Days and the Past 12 Months.....	22
5	Prevalence of Cigar, Pipe, and Smokeless Tobacco Use, Past 12 Months.....	28
6	Serious Attempt to Stop Smoking Cigarettes Among Smokers During the Past 2 Years.....	30
7	Summary of Health Behaviors.....	41
8	Beliefs About How AIDS is Transmitted and How Sexual Transmission Can be Prevented.....	44
9	Beliefs About Acceptability and Effects of Alcohol and Drug Use, Regulatory Policies, and Urinalysis Testing.....	47

List of Figures

<u>Number</u>		<u>Page</u>
1	Trends in Substance Use Past 30 Days, Total DoD, 1980-88.....	9
2	Trends in Substance Use Past 30 Days by Service, 1980-88.....	10
3	Alcohol Use Negative Effects, Total DoD, 1980-88.....	11
4	Drug Use Negative Effects, Total DoD, 1980-88.....	12
5	Trends in Average Daily Ounces of Ethanol Consumption, 1980-88.....	14
6	Trends in Heavy Alcohol Use, Past 30 Days, 1980-88.....	15
7	Heavy Alcohol Use by Pay Grade, Total DoD.....	17
8	Heavy Alcohol Use for E1-E3s by Service.....	17
9	Trends in Any Drug Use Past 30 Days, by Service, 1980-88...	20
10	Any Drug Use by Pay Grade, Total DoD.....	23
11	Any Drug Use for E1-E3s by Service.....	23
12	Trends in Cigarette Use, Past 30 Days, Total DoD, 1980-88.....	25
13	Trends in Any Cigarette Use, Past 30 Days by Service, 1980-88.....	26
14	Trends in Heavy Cigarette Use, Past 30 Days by Service, 1980-88.....	27
15	Cigarette Use by Pay Grade, Total DoD.....	28
16	Alcohol-Related Serious Consequences by Service, 1980-88...	32
17	Alcohol-Related Productivity Loss by Service, 1980-88.....	32
18	Alcohol-Related Dependence by Service, 1980-88.....	33
19	Alcohol Use Negative Effects by Pay Grade, Total DoD, 1980-88.....	34
20	Alcohol Use Negative Effects for E1-E3s by Service, 1980-88.....	34
21	Drug-Related Serious Consequences by Service, 1980-88.....	36
22	Drug-Related Productivity Loss by Service, 1980-88.....	36
23	Drug Use Negative Effects by Pay Grade, Total DoD, 1980-88.	37
24	Drug Use Negative Effects for E1-E3s by Service, 1980-88...	38

1. BACKGROUND AND APPROACH

This report provides highlights of the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel conducted by the Research Triangle Institute (RTI) of Research Triangle Park, North Carolina. This investigation is the fourth in a series of surveys of military personnel conducted in 1980, 1982, 1985, and 1988 under the direction of the Office of Assistant Secretary of Defense (Health Affairs). All of the surveys investigate the prevalence of alcohol use, nonmedical drug use, and tobacco use, and the consequences of alcohol and drug use for military readiness, combat efficiency, and work performance. The 1985 and 1988 surveys also consider the role of health behaviors other than substance use and the implications of health behaviors for military readiness and the overall well-being of military personnel. In addition, the 1988 survey examines attitudes and knowledge about AIDS transmission and prevention.

Findings from the survey are examined in light of the military's health promotion policies and programs. Six broad program areas constitute the military's approach to health promotion: smoking cessation and prevention, physical fitness, nutrition, stress management, alcohol and drug abuse prevention, and hypertension prevention.

The 1988 Worldwide Survey is guided by five major objectives:

- describe the prevalence of substance use (alcohol use, non-medical drug use, tobacco use) among military personnel,
- identify the physical, social and work consequences of this use,
- identify the demographic and behavioral characteristics of substance users to include age, rank, Service, social and family climate, and reported reasons for using, not using, or discontinuing use,
- compare reported drug and alcohol use and smoking habits to prior Worldwide Surveys, and
- assess the health behaviors of Service members with regard to smoking, fitness, and other health behaviors.

This highlights report provides a chapter-by-chapter summary of the 1988 Worldwide Survey report (Bray et al., 1988) including key tables and figures. Findings from the 1985 Worldwide Survey are reported in Bray et al. (1986), from the 1982 Worldwide Survey in Bray et al. (1983), and from the 1980 Worldwide Survey in Burt et al. (1980).

The general methodology of the 1988 Worldwide Survey is summarized in Chapter 2 of this brief report. Chapter 3 provides an overview of trends in substance use, negative effects associated with alcohol and drug use, and involvement in health behaviors.

The remaining chapters report survey findings in more detail. Chapters 4, 5, and 6 describe the prevalence, trends, correlates, and relation to the military job of alcohol use, drug use, and tobacco use, respectively. The consequences of alcohol and drug use for the health, social relationships, and work performance of military personnel are described in Chapter 7, while Chapter 8 presents analyses of the prevalence of health practices and the relationship of substance use to health. Attitudes and information about AIDS are examined in analyses reported in Chapter 9. Chapter 10 describes the context of military programs oriented toward substance abuse prevention and treatment. The final chapter, Chapter 11, discusses findings from the 1988 Worldwide Survey in view of DoD health promotion policy and AIDS educational efforts.

2. METHODOLOGY OF THE 1988 WORLDWIDE SURVEY

The methodology of the 1988 Worldwide Survey was similar to that used in the 1985 and 1982 Worldwide Surveys, also conducted by the Research Triangle Institute. This chapter describes the sampling and data collection procedures and provides an overview of measurement approaches.

A. Sampling and Data Collection Procedures

The sampling design for the 1988 Worldwide Survey was a deeply stratified, two-stage, two-phase probability sample. The eligible population for the survey consisted of all active-duty military personnel except recruits, Service academy students, persons absent without leave (AWOL), and persons who had a permanent change of station (PCS) at the time of data collection.

The first-stage sample consisted of military installations (and associated units clustered with the installations based on geographical proximity) for each Service located in four broad regions of the world (Americas, North Pacific, Other Pacific, Europe). The second-stage sample consisted of military personnel stationed at the selected first-stage installations who were randomly selected within pay grades (E1-E3, E4-E6, E1-E9, W1-W4, O1-O3, O4-O10).

During Phase 1, questionnaires were administered in group settings at selected installations across the world under the supervision of Research Triangle Institute field teams. Team members explained the purpose of the survey, encouraged cooperation and honest responses, and answered respondents' questions. Questionnaires were distributed and completed and then sent to a scoring contractor for optical scan processing. The identity of participants was anonymous. Naval personnel selected for the sample who were on ships that were inaccessible to field teams were surveyed by a military liaison officer. To ensure confidential treatment of these questionnaires, a clerk from the ship's mail room collected the completed questionnaires in a mail bag after the group sessions and shipped them to the U.S. for processing.

During Phase 2, questionnaires were mailed to a selected subsample of personnel who did not participate during Phase 1 with instructions to complete the questionnaire and mail it in a business reply envelope (that was supplied) to the U.S. for processing. The identity of respondents was anonymous.

Table 1 presents the number of completed questionnaires for the study and the survey performance rates. As shown, usable questionnaires were obtained from 18,673 military personnel, and the overall response rate among eligibles for the study was 81.4 percent.

Table 2 presents the sociodemographic characteristics of the 1988 eligible respondent population. Characteristics of the respondent population may differ somewhat from characteristics of the total Active Force due to exclusion from the sample of recruits, academy students and personnel who were AWOL or PCS. As shown in Table 2, the majority of personnel are males

Table 1. Survey Respondents and Performance Rates

Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Survey Respondents (N)</u>					
Enlisted personnel	4,791	3,777	1,519	4,302	14,389
Officers	1,679	1,020	451	1,134	4,284
Total	6,470	4,797	1,970	5,436	18,673
<u>Performance Rates (%)</u>					
Availability rate ^a	83.4	78.2	75.1	84.3	81.3
Completion rate ^b	90.3	81.3	88.2	90.7	87.9
Response rate among eligibles ^c	82.9	76.1	76.8	86.2	81.4

Note: Entries are frequencies for survey respondents and percentages for performance rates.

^bRate at which eligible persons were available to participate in Phase 1 group sessions. Some persons were unavailable due to illness, temporary duty assignments, and leave.

^bRate at which eligible individuals took part in the survey during Phase 1.

^cOverall rate at which eligible persons from both phases took part in the survey.

(88.8 percent); white (69.4 percent), age 30 or below (66.4 percent), married (60.5 percent), in pay grades E1-E6 (72.9 percent), and have a high school education or beyond (99.2 percent).

Table 2 and those in the following chapters often present two numbers in each cell. The first number is an estimate of the percentage of the population with the characteristics that define the cell. The second number, in parentheses, is the standard error of the estimate. Standard errors represent the degree of variation associated with observing a sample rather than every member of the population.

B. Measurement Approaches

Measurement for this study focuses on prevalence and correlates of substance use and abuse, adverse negative effects, and health behaviors. Alcohol use is measured in terms of two summary indexes: average daily ounces of absolute alcohol (ethanol) and drinking levels. The ethanol index is computed as a function of the amount of ethanol contained in the ounces of beer, wine, and hard liquor consumed on a typical drinking day during the past 30 days, the frequency of use of each beverage, and the amount of ethanol consumed on atypical ("heavy") drinking days during the past 12 months. The index represents average daily ounces of ethanol consumed during a 12-month period.

Table 2. Sociodemographic Characteristics of Eligible Respondent Population

Sociodemographic Characteristic	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Sex</u>					
Male	88.5 (1.1)	88.8 (3.2)	91.6 (1.0)	88.4 (0.7)	88.8 (1.0)
Female	11.5 (1.1)	11.2 (3.2)	8.4 (1.0)	11.6 (0.7)	11.2 (1.0)
<u>Race/Ethnicity</u>					
White	58.1 (1.7)	75.0 (1.0)	68.9 (1.0)	75.9 (1.3)	69.4 (0.9)
Black	27.8 (1.5)	12.3 (1.1)	16.3 (2.4)	14.3 (0.9)	18.5 (0.8)
Hispanic	9.0 (0.6)	7.7 (1.5)	11.1 (1.7)	6.4 (1.0)	8.0 (0.6)
Other	4.1 (0.3)	5.0 (1.0)	3.7 (0.6)	3.3 (0.4)	4.1 (0.3)
<u>Education</u>					
Less than high school	0.9 (0.2)	1.3 (0.2)	1.0 (0.3)	0.3 (0.2)	0.8 (0.1)
High school grad/GED	46.5 (2.3)	47.3 (2.9)	58.6 (6.2)	27.4 (1.8)	42.1 (1.5)
Some college	33.3 (1.0)	34.0 (1.2)	27.4 (4.9)	49.2 (2.0)	37.7 (0.9)
College degree or beyond	19.3 (2.3)	17.4 (2.5)	13.0 (2.6)	23.2 (2.9)	19.4 (1.4)
<u>Age</u>					
17-20	14.0 (1.5)	15.4 (2.8)	21.4 (4.0)	9.8 (1.4)	13.8 (1.1)
21-25	28.2 (1.8)	32.1 (2.5)	36.1 (3.2)	29.5 (2.2)	30.4 (1.2)
26-30	23.0 (0.7)	20.6 (2.0)	20.5 (2.7)	23.2 (0.8)	22.2 (0.7)
31-35	16.5 (1.1)	13.6 (1.1)	10.4 (0.9)	15.7 (0.8)	14.9 (0.6)
36 or older	18.3 (1.6)	18.3 (3.0)	11.6 (3.2)	21.8 (2.4)	18.8 (1.2)
<u>Marital Status</u>					
Not married	38.1 (1.5)	46.6 (5.2)	48.1 (2.5)	32.0 (2.0)	39.5 (1.9)
Married	61.9 (1.5)	53.4 (5.2)	51.9 (2.5)	68.0 (2.0)	60.5 (1.9)
<u>Pay Grade</u>					
E1-E3	16.7 (1.5)	20.4 (3.7)	40.4 (6.6)	20.6 (2.1)	21.0 (1.4)
E4-E6	53.7 (0.6)	55.9 (1.5)	37.9 (4.2)	50.2 (2.0)	51.9 (1.0)
E7-E9	11.6 (1.0)	9.8 (1.4)	9.1 (1.3)	10.0 (0.8)	10.4 (0.6)
W1-W4	2.4 (0.3)	0.8 (0.1)	1.0 (0.3)	* (*)	1.0 (0.1)
O1-O3	9.5 (0.9)	7.9 (1.3)	7.9 (1.3)	11.8 (1.7)	9.6 (0.7)
O4-O10	6.2 (1.3)	5.4 (1.0)	3.7 (1.9)	7.4 (1.6)	6.1 (0.7)
Total Personnel	33.4 (1.8)	27.8 (3.6)	8.8 (0.9)	30.0 (1.7)	- -

Note: Tabled values are column percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

The drinking level classification defines five drinking level groups (abstainers, infrequent/light, moderate, moderate/heavy, and heavy drinkers) based on quantity and frequency data during the past 30 days for the respondent's primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-3 times/month and 1-4 drinks/occasion. Those in the Moderate category drink (a) at least once/week and 1 drink/occasion, (b) 2-3 times/month and 2-4 drinks/occasion, or (c) once/month or less and 5 or more drinks/occasion. Those in the Moderate/Heavy category drink at least once/week and 2-4 drinks/occasion or 2-3 times/month and 5 or more drinks/occasion. Those in the Heavy category drink at least once/week and 5 or more drinks/occasion.

Drug use is measured by the frequency of nonmedical use of: marijuana or hashish, PCP, LSD or other hallucinogens, cocaine, amphetamines or other stimulants, tranquilizers or other depressants, barbiturates or other sedatives, heroin or other opiates, analgesics or other narcotics, inhalants,

and "designer drugs." Composite measures of the prevalence of use of any of these drugs, marijuana only, and any drug except marijuana are constructed. "Any drug use" refers to nonmedical use of one or more of the 11 categories of drugs. "Any drug except marijuana" is defined similarly except marijuana is not included in the set of drugs considered. Another index considers patterns of use: no use, marijuana-only use, and any other drug use pattern (which could include marijuana use but requires use of one or more additional types of drugs). The other use pattern does not imply simultaneous use of the drugs but, rather, the use of several types of drugs during the past 30 days or 12 months.

Measures of cigarette use assess prevalence of any current smoking and heavy smoking during the past 30 days. Current smokers are defined as those who smoked at least 100 cigarettes during their lifetimes and smoked during the past 30 days. Heavy smokers are defined as current smokers who smoke one or more packs of cigarettes per day. The prevalence of any cigar/pipe smoking or smokeless tobacco use is assessed during the past 12 months.

Measures of negative effects due to alcohol or drug use during the past 12 months are serious consequences, productivity loss, and dependence. The index of serious consequences shows the percentage of personnel who report any occurrence of problems including UCMJ punishment, loss of 3 or more work days, fights, arrests, incarceration, injury or illness, spouse leaving, not getting promoted, or treatment due to alcohol or drug use. The productivity loss index assesses time lost from work due to alcohol or drug use as a result of being late for work or leaving early, being high or drunk at work or working below normal productivity levels. The dependence measure reflects a physiological or subjective need for alcohol and is assessed using four symptoms: blackouts, tremors (shakes), impaired control, and morning drinking.

Additional measures examine involvement in various health practices (e.g., physical exercise, eating, sleeping, moderate alcohol use, no drug use, no smoking) as well as health care utilization (number of illnesses, number of doctor visits, number of days hospitalized during the past 12 months), and awareness about AIDS.

The items included in the 1988 Worldwide Survey questionnaire enable comparison with prior Worldwide Surveys to examine trends in substance use and health behaviors among military personnel. Both descriptive and multivariate regression analyses of survey data were conducted. Standardization techniques were also used to statistically control for differences in age, education and marital status across the Services and across the surveys.

3. OVERVIEW OF TRENDS IN SUBSTANCE USE, NEGATIVE EFFECTS AND HEALTH BEHAVIORS

Prior surveys of military personnel and civilians have documented a decrease in the prevalence of alcohol use, drug use, and cigarette smoking during the 1980s. The decline in cigarette smoking reflects a longer term trend toward lower rates of use that began after the release of the first report of the Surgeon General's Advisory Committee in 1964. For alcohol and drug use, the decrease is more recent.

A. Trends in Prevalence of Substance Use

Data from the 1988 Worldwide Survey support the finding of a continuing downward trend in alcohol use, drug use, and cigarette smoking among military personnel during the 1980s. Corresponding to these decreases in alcohol use and drug use are decreases in negative effects associated with alcohol and drug use. The involvement of military personnel in other health practices showed a small increase. A summary of these trends for all Department of Defense personnel from the four Worldwide Surveys is provided in Table 3.

- Heavy alcohol use, any drug use, and cigarette use have declined since 1980 and are now the lowest since the survey series began.

Figure 1 presents trends in substance use from 1980 to 1988. As shown, heavy alcohol use, any nonmedical use of drugs, and cigarette smoking declined between 1980 and 1988. The decreases between 1980 and 1988 and between 1985 and 1988 were statistically significant for each of the three substances.

- Changes observed for total DoD in heavy alcohol use, any drug use and cigarette use were observed for each of the Services.

As shown in Figure 2, each of the Services follows the DoD pattern of a significant downward trend in heavy alcohol use, any drug use, and cigarette use between 1980 and 1988. Trends in use for each of the Services differ slightly from the total DoD trend, but the same pattern of decrease prevails. All of the decreases in substance in from 1980 to 1988 were statistically significant for each of the Services, but not all of the decreases from 1985 to 1988 were statistically significant.

- The decreases are largest for any drug use.

As shown in Table 3, the percentage of military personnel who were heavy drinkers declined from 14.1 percent in 1980 to 8.2 percent in 1988. The percentage of military personnel who used any drug during the past 30 days decreased from 27.6 percent in 1980 to 4.8 percent in 1988. The percentage who were cigarette smokers decreased from 51.0 percent in 1980 to 40.9 percent in 1988.

- Only drug use decreased significantly between each of the four surveys.

Table 3. Substance Use and Health Summary, 1980-88 - Total DoD

Measure	Year of Survey			
	1980	1982	1985	1988
<u>Drinking Level</u>				
Abstainer	13.4 (0.5) b,c	11.8 (0.5) d	13.4 (0.6) e	17.2 (0.4)
Infrequent/Light	14.1 (0.5) b,c	18.9 (0.8)	17.9 (0.7)	19.0 (0.6)
Moderate	33.6 (0.8) b,c	29.8 (0.6)	31.1 (0.7)	32.1 (0.6)
Moderate/Heavy	24.6 (0.5)	25.5 (0.5)	25.6 (0.7)	23.5 (1.1)
Heavy	14.1 (0.9) c	14.0 (0.8)	11.9 (0.8) e	8.2 (0.6)
<u>Any Drug Use^a</u>				
Past 30 Days	27.6 (1.5) b,c	19.0 (1.0) d	8.9 (0.8) e	4.8 (0.3)
Past 12 Months	36.7 (1.5) b,c	26.6 (1.0) d	13.4 (1.0) e	8.9 (0.8)
<u>Cigarette Use, Past 30 Days</u>	51.0 (0.8) c	51.4 (0.8) d	46.2 (1.0) e	40.9 (0.8)
<u>Alcohol Use Negative Effects</u>				
Serious Consequences	17.3 (1.1) b,c	14.6 (0.6) d	10.7 (0.9)	9.0 (0.6)
Productivity Loss	26.7 (1.2) b,c	34.4 (0.7) d	27.1 (1.1) e	22.1 (1.2)
Dependence	8.0 (0.6) c	9.0 (0.5)	7.7 (0.7)	6.4 (0.5)
<u>Drug Use Negative Effects</u>				
Serious Consequences	13.3 (1.0) b,c	6.2 (0.4) d	3.0 (0.4) e	1.8 (0.2)
Productivity Loss	14.4 (1.1) b,c	9.9 (0.5) d	3.4 (0.6)	2.1 (0.4)
<u>Health Practices, Past 12 Months</u>	-	-	3.79 (0.02) e	3.91 (0.04)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Negative effects for alcohol and drugs are reported for the past 12 months.

^aAny nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, inhalants, and "designer drugs."

^bComparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

^cComparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

^dComparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^eComparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

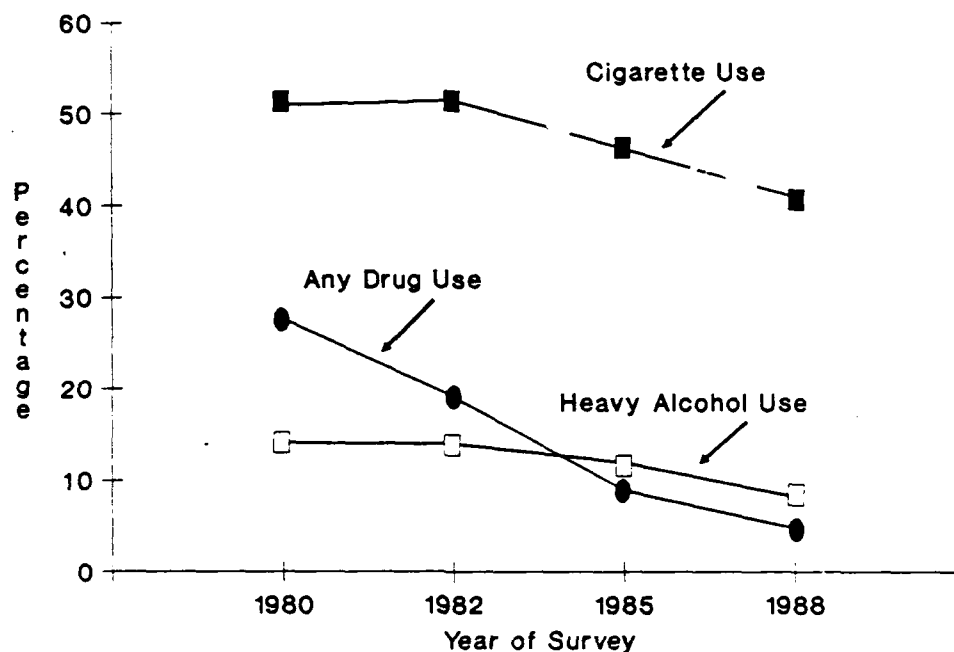
-Data are not available before 1985.

The decreases in any drug use were statistically significant between each of the Worldwide Surveys, while heavy alcohol use decreased significantly only after 1985 and cigarette use decreased significantly after 1982.

- Changes in alcohol use, drug use, and cigarette smoking between 1980 and 1988 are not accounted for by shifts in the sociodemographic composition of the military population.

The military population is somewhat older, has more officers, has more married personnel, and is better educated than in 1980--factors that are associated with lower rates of substance use. Standardization of the 1982,

Figure 1. Trends in Substance Use Past 30 Days, Total DoD, 1980-88



1985, and 1988 rates of heavy alcohol use, any drug use, and cigarette use to the 1980 sociodemographic distribution of the total DoD changed the rates somewhat but did not alter the overall findings for the significance of changes between 1980 and 1988. Thus, the observed changes in the prevalence of use are not accounted for by shifts in the sociodemographic composition of the military population between 1980 and 1988.

B. Trends in Negative Effects

- Alcohol-related negative effects declined significantly between 1980 and 1988.

In 1980, as shown in Figure 3 and Table 3, 17.3 percent of military personnel reported having experienced one or more serious consequences associated with alcohol use during the year. By 1988, only 9.0 reported this. Alcohol-related productivity loss decreased from 26.7 percent in 1980 to 22.1 percent in 1988. Alcohol dependence decreased from 8.0 percent in 1980 to 6.4 percent in 1988. Each of the three measures of alcohol-related negative effects (any serious consequences, productivity loss, and dependence) declined significantly between 1980 and 1988, but only productivity loss declined significantly between 1985 and 1988.

- Drug-related negative effects declined between 1980 and 1988.

In 1980, as shown in Figure 4 and Table 3, 13.3 percent of military personnel reported experiencing one or more drug-related serious consequences during the year; by 1988, only 1.8 percent reported this. Drug-related productivity loss also declined from 14.4 percent of military personnel in 1980 to 2.1 percent in 1988. The declines in both measures of

Figure 2. Trends in Substance Use Past 30 Days by Service, 1980-88

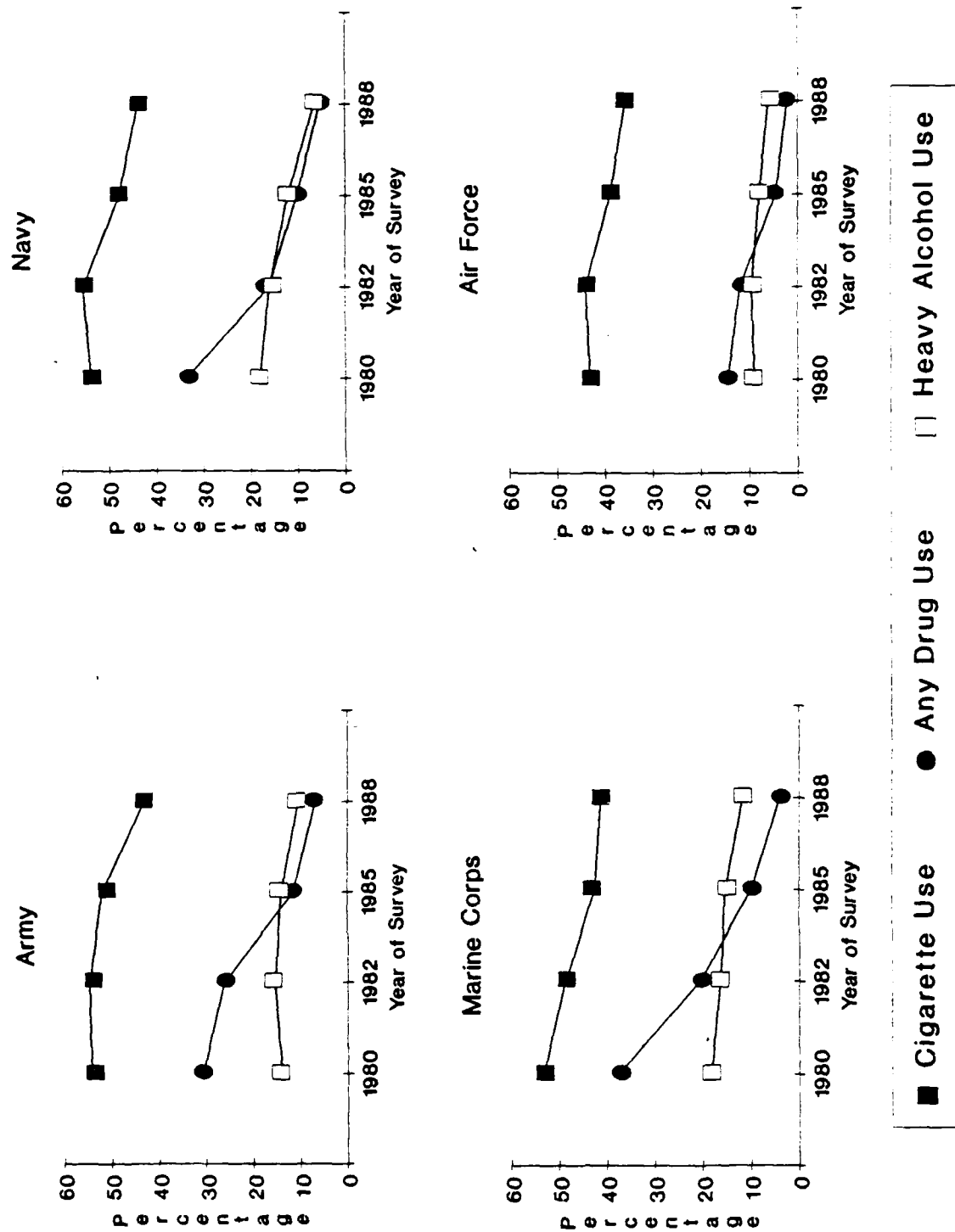
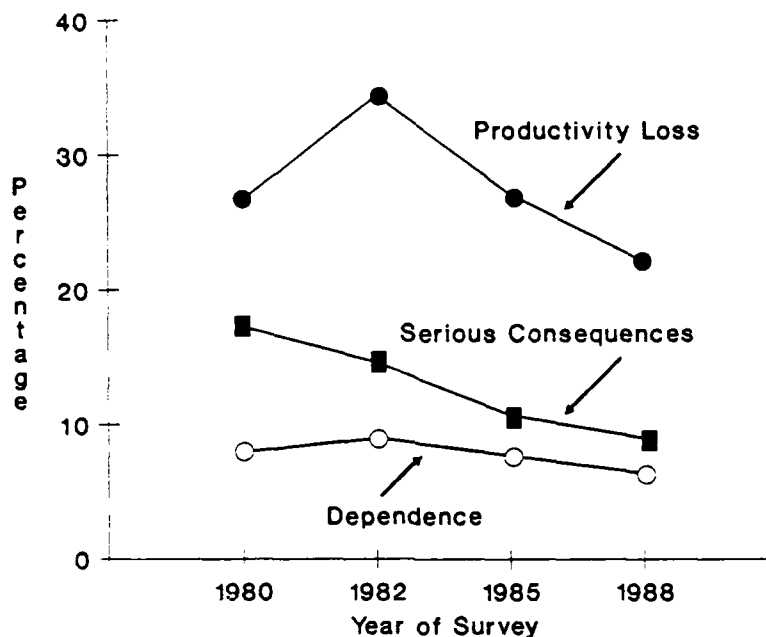


Figure 3. Alcohol Use Negative Effects, Total DoD, 1980-88



drug-related negative effects were statistically significant between 1980 and 1988, but only the decline in any drug-related serious consequences was significant between 1985 and 1988.

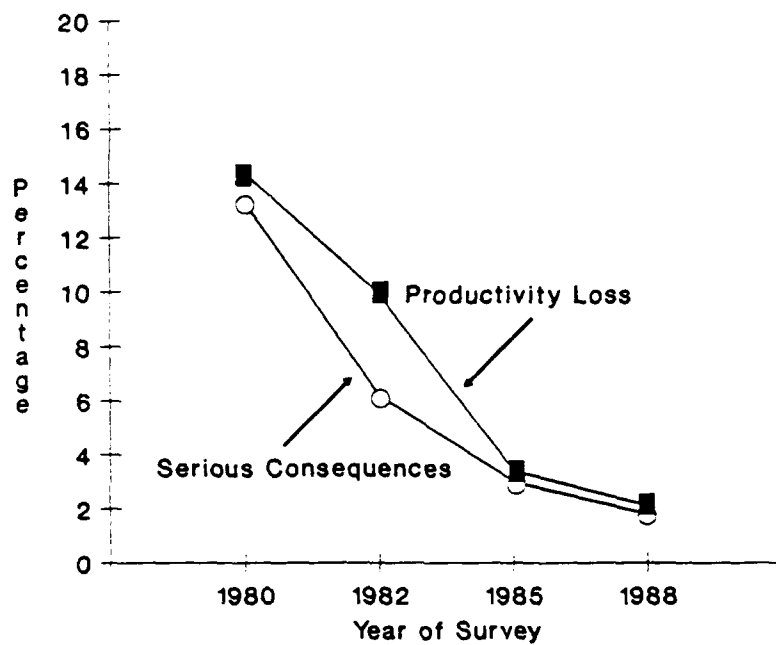
C. Trends in Health Practices

- Involvement in health practices increased between 1985 and 1988.

The 1985 Worldwide Survey first monitored the involvement of military personnel in health practices other than substance use. In 1985, military personnel reported that they had on average engaged in 3.79 of six health practices; by 1988, this figure was 3.91, a small but statistically significant increase. The six health practices were: using alcohol moderately or less, not using drugs, never smoking cigarettes, exercising twice a week or more, eating two full meals a day at least 5 days per week, and sleeping 6 or more hours a day at least 5 days a week.

In sum, substantial and significant declines in alcohol use, drug use, and cigarette use and in the negative effects associated with alcohol and drug use were found among military personnel during the 1980s. Although these decreases may partially reflect related changes among civilians, they are likely also the result of intense military efforts to prevent substance abuse. The involvement of military personnel in other health behaviors increased slightly between 1985 and 1988 (the period for which such data were available).

Figure 4. Drug Use Negative Effects, Total DoD, 1980-88



4. ALCOHOL USE

A number of surveys of civilian populations conducted over the past decades, coupled with longer term information about alcohol sales and more recent surveys of military populations, indicate that most Americans drink alcoholic beverages, but they are now drinking less. The average amount of alcohol consumed has decreased, and the percentage of abstainers has increased slightly over recent years.

A. Trends in Alcohol Consumption

- The average daily amount of ethanol consumed by all DoD personnel and by personnel in each of the Services has declined steadily since 1980; consumption was relatively stable between 1980 and 1982 but substantial decreases occurred after 1982.

The average daily ounces of ethanol consumed declined significantly between 1980 and 1988 for the total DoD and each of the Services, as shown in figure 5 and Appendix Table A.1. The decreases in consumption were particularly apparent after 1982. Only the Marine Corps showed a significant decrease in overall consumption between 1980 and 1982 (and no significant decreases thereafter). For the total DoD and the other Services, significant decreases in consumption occurred after 1982. This finding is consistent with the fact that military efforts to prevent alcohol abuse have recently been intensified.

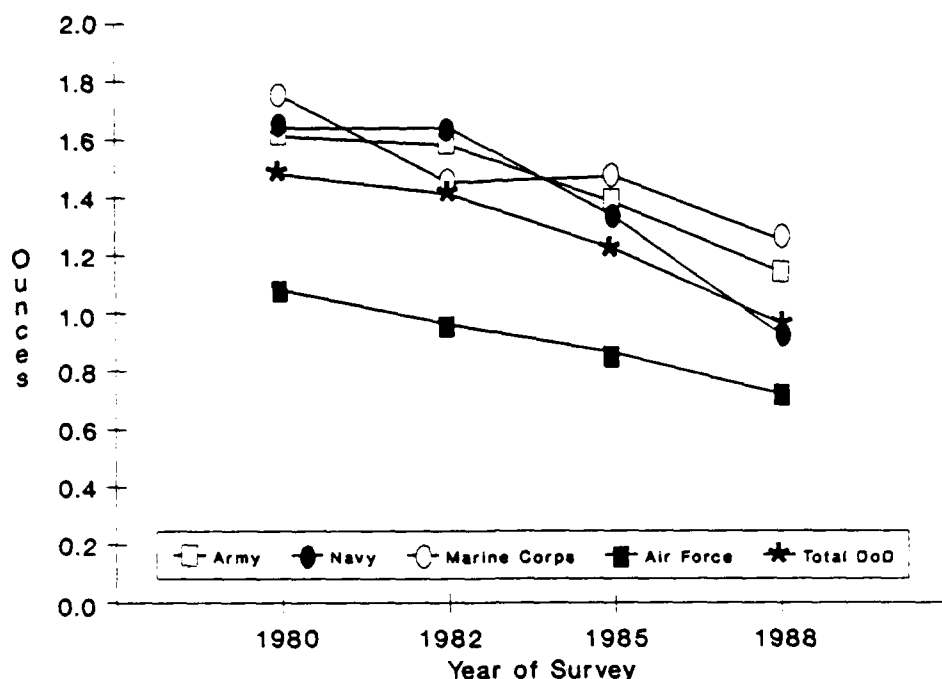
- The decreases in alcohol consumption over time for the total DoD and the Services are not in large part accounted for by changes in the sociodemographic composition of the military population.

Estimates for average daily alcohol consumption for the 1982 and later surveys were standardized to determine whether the observed decreases were related to the fact that the military population has become older, more likely to be married, and better educated. Estimates from the 1982, 1985 and 1988 surveys were standardized to the 1980 age/education/marital status distribution. Comparison of unstandardized and standardized rates indicates that the two sets of estimates are highly similar. However, the two sets of rates diverge in two respects. Standardization indicates that neither the Marine Corps 1980-1988 change nor the 1982-1985 change for the total DoD was statistically significant. Thus, although part of the observed decline in alcohol consumption may be associated with changes in demographic composition, in general it was not.

- Heavy drinking declined significantly for all Services between 1980 and 1988, but most notably among Navy personnel.

The decreases in overall alcohol consumption are consistent with changes in drinking levels. Heavy alcohol use for DoD and all Services declined significantly between 1980 and 1988, as shown in Figure 5 and Table A.1 (Appendix A). The decreases were particularly dramatic among Navy personnel. In 1980, Navy personnel were matched with the Marines in

Figure 5. Trends in Average Daily Ounces of Ethanol Consumption, 1980-88



having the highest percentage of heavy drinkers, but by 1988, their use rate declined 11.7 percentage points to match the lowest use rate of Air Force personnel. Aside from this notable change by the Navy, the relative ranking of the Services has remained constant, especially since 1982--Marines and Army at about the same levels and Air Force at the lowest level.

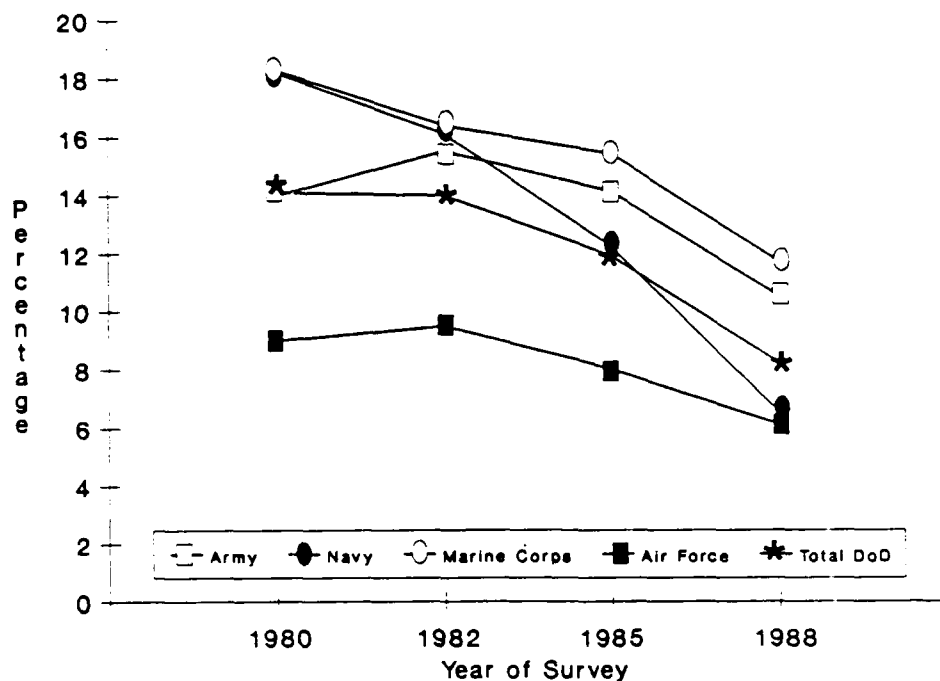
- Alcohol consumption during the 1980s was consistently lower among Air Force personnel compared with the other Services, and these differences are not accounted for by differences in the sociodemographic composition of the Services.

As shown in Figures 5 and 6, the average daily consumption of ethanol and the percentage of heavy drinkers have consistently been lower among Air Force personnel, although by 1988 the percentages of heavy drinkers among Air Force and Navy personnel were similar. Observed differences between the Services may be due in part to the fact that Air Force personnel are more likely to be older, better educated, and married than personnel in the other Services. Estimates of average daily ounces of ethanol and the percentage of heavy drinkers for each Service were standardized for age, education, and marital status to the total DoD distribution. Standardization did not alter the pattern of significance among the comparisons of unstandardized rates. Therefore, observed Service differences in alcohol use are not associated with Service differences in sociodemographic composition.

B. Patterns and Correlates of Use

- Beer is the most commonly consumed beverage, followed by liquor and wine.

Figure 6. Trends in Heavy Alcohol Use, Past 30 Days, 1980-88



Beer is consumed by 71.7 percent of military personnel, liquor by 32.2 percent, and wine by 45.6 percent. Compared with findings from the 1985 Worldwide Survey, these figures indicate that users of each beverage have declined.

- Most military personnel do not drink frequently or heavily.

For beer, wine, and liquor, the most common pattern of consumption is drinking less than weekly and 1 to 3 drinks per occasion.

- Heavy drinkers have different beliefs about drinking than do light drinkers or abstainers.

Heavy drinkers were less likely than abstainers to believe that they would be drunk, act foolishly, or injure themselves after 6 drinks on a single occasion and more likely to believe that they would feel good, have a good time, and remain in control. Further, they rate being drunk and being asked to drink more as less objectionable than do abstainers.

- Controlling for the effects of other factors, drinking is significantly associated with sociodemographic characteristics and attitudinal/behavioral variables.

Regression analyses were conducted to examine the independent effects of a variety of factors on heavy drinking and on the amount of alcohol consumed. Ten sociodemographic variables were used in the regression analysis (Service, race/ethnicity, sex, education, family status, region,

pay grade, years of service, age of respondent, and age at first regular use of alcohol) and six psychological/behavioral indicators (reported stress at work, health practices, the drinking attitudes index, the drinking climate index, the drinking motivation index, and beliefs about heavy drinking index). Details about these measures and analyses appear in the final report (Bray et al. 1988).

Results show that heavy drinking is strongly predicted by family status, pay grade, sex, educational status, drinking motivation, and beliefs about heavy drinking. The probability of being a heavy drinker is significantly more likely among military personnel who are single, enlisted, and males; who did not continue their education beyond high school; who are more highly motivated to drink; and who believe that negative consequences will not result from heavy drinking than their counterparts.

Average daily ounces of ethanol consumed is strongly predicted by family status, pay grade, race/ethnicity, sex, Service, education, region, age at first regular use; drinking motivation, health practices, drinking climate, drinking attitudes, and beliefs about heavy drinking. The average daily consumption of more ounces of ethanol is significantly more likely among personnel who are: single, in pay grades E1-E3, black, males, and in the Army or the Marines; who did not continue their education beyond high school; who are highly motivated to drink; who engage in fewer health practices; who believe that the military will help those with alcohol problems; and who have favorable attitudes and beliefs toward drinking.

Findings suggest that education should focus on informing military personnel about problems of drinking and alternative ways of meeting social, recreational, and personal needs besides drinking.

- Heavy alcohol use is highest among junior enlisted personnel and lowest among officers.

Figure 7 and Table A.2 (Appendix A) present data showing heavy alcohol use by pay grade. As shown in Figure 7, the percentage of heavy drinkers is highest among those in lower pay grades and lowest among those in higher pay grades. Overall for DoD, 12.3 percent of E1-E3s report heavy use, followed by 9.1 percent of E4-E6s, 5.3 percent of E7-E9s, 4.6 percent of warrant officers, 1.9 percent of O1-O3s, and 1.4 percent of O4-O10s.

- Among junior enlisted personnel, heavy alcohol use is highest for the Army and Marine Corps and lowest for the Navy and Air Force.

Figure 8 and Table A.2 show heavy alcohol use among the junior enlisted personnel (E1-E3s) for each Service. As shown, the percentages of heavy drinkers in the Army (18.0 percent) and Marine Corps (15.8 percent) are substantially higher than those in the Navy (7.7 percent) or the Air Force (8.6 percent).

C. Alcohol Use and the Military Job

- About 10 percent of military personnel drink before or during work hours.

Figure 7. Heavy Alcohol Use by Pay Grade, Total DoD

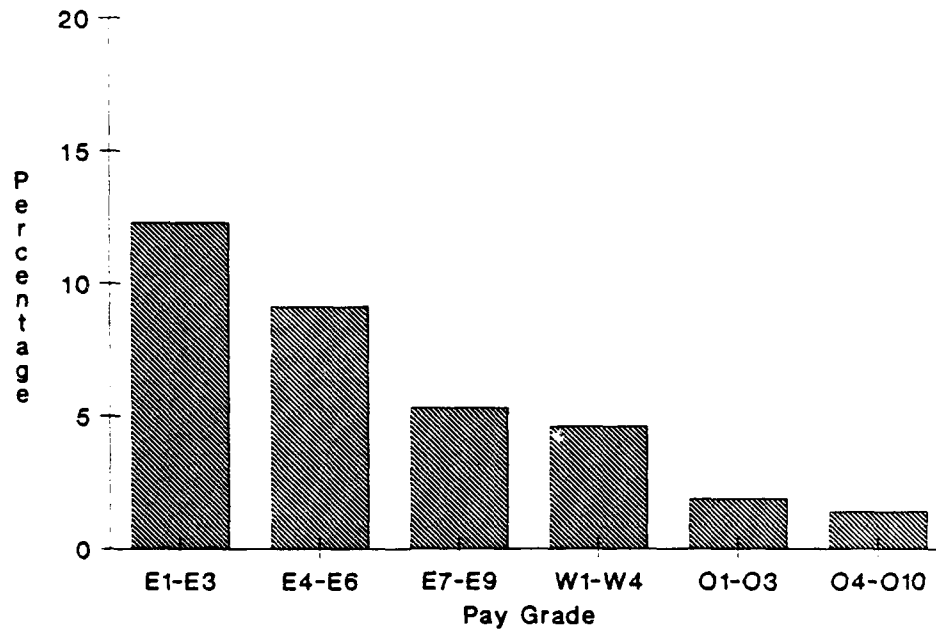
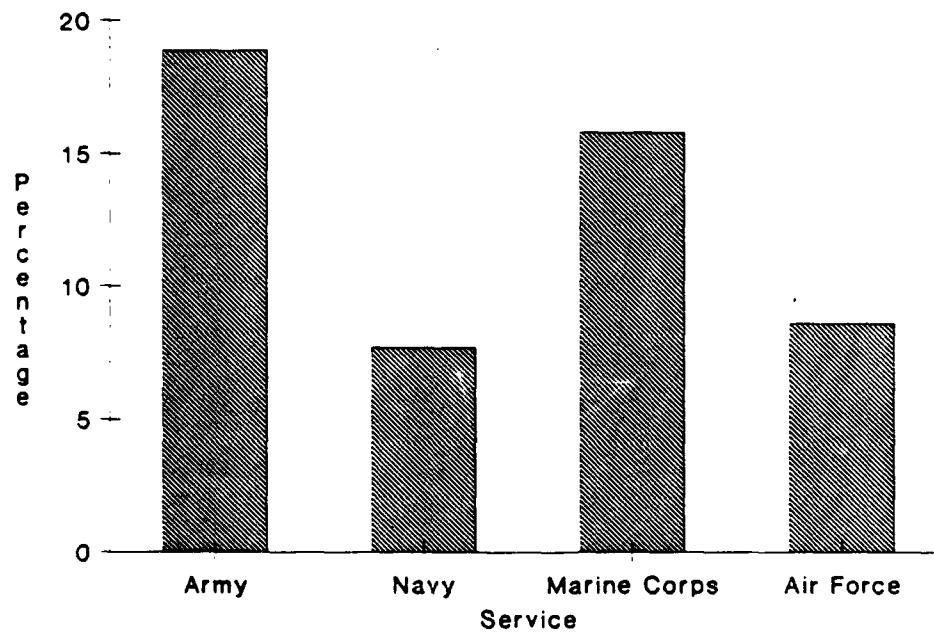


Figure 8. Heavy Alcohol Use for E1-E3s by Service



Almost 5 percent of military personnel drink within 2 hours of going to work, 6.8 percent drink during lunch break, 2.0 percent drink during work or a work break, and 10.0 percent engage in any of these three behaviors. These behaviors may detract from work performance and overall readiness.

- Military personnel are more likely to state that they drink less now than when they entered military service.

About 26 percent of military personnel state that they drink more now, 21.1 percent state they drink about the same, 40.2 percent state they drink less than when they entered military service, and 12.2 percent were abstainers before and after entering military service.

- Those who report being under more stress at work report drinking more.

The percentage of moderate/heavy and heavy drinkers is higher for those who report being under a great deal of stress than those for who report being under no stress. This pattern is stronger for enlisted personnel than for officers.

In sum, substantial decreases in the overall volume of drinking and in heavy drinking have occurred since 1980, and particularly since 1985. These decreases are tied in part to similar decreases among civilians, but they also reflect the effectiveness of military efforts to prevent the misuse of alcohol.

5. DRUG USE

Use of illicit drugs or use of prescriptive drugs for nonmedical purposes decreased during the 1980s for both civilians and military personnel. Surveys of civilian populations document a decrease in the use of most drugs that began after 1979, while surveys of military personnel find a downward trend in drug use since at least 1980 when the Worldwide Survey series began. Findings from the 1988 Worldwide Survey support this finding of a continuing downward trend.

A. Trends in Drug Use

- Use of any drug decreased significantly between each of the Worldwide Surveys; 1988 rates are the lowest since the survey series began.

Drug use reported by military personnel declined dramatically during the 1980s, as shown in Figure 1 and Table 3. Use of any drug during the past 30 days declined from 27.6 percent of military personnel in 1980 to 4.8 percent in 1988. In addition, marijuana use and use of drugs other than marijuana declined significantly between 1985 and 1988. In 1985, 6.5 percent of total DoD personnel reported using marijuana during the past 30 days, compared with 2.9 percent in 1988; comparable figures for drug use other than marijuana were 5.8 percent in 1985 and 3.1 percent in 1988.

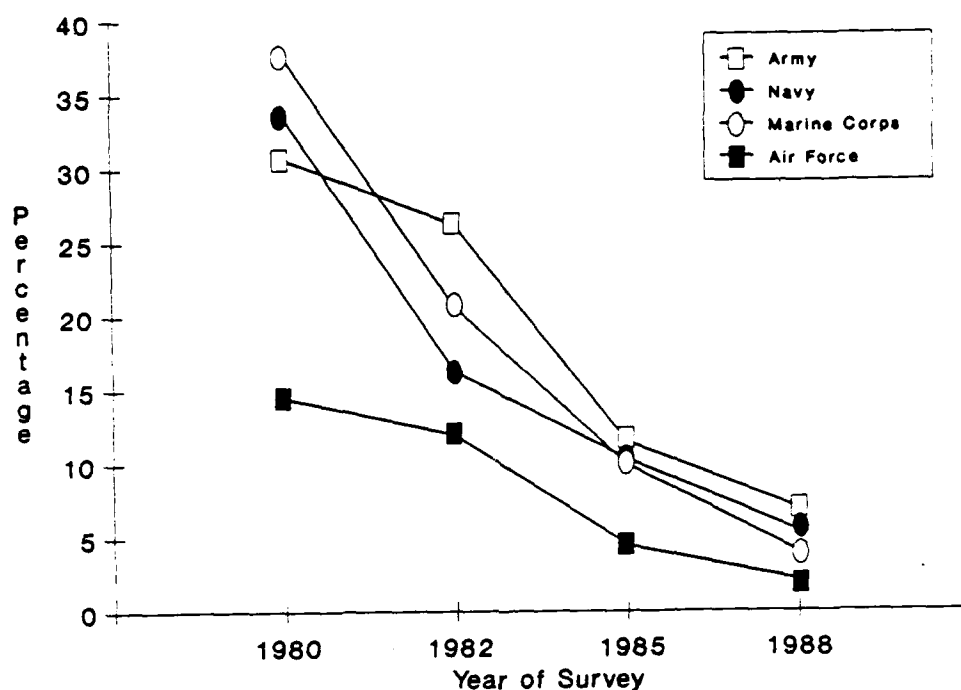
- Change in the sociodemographic composition of the military population between 1980 and 1988 was not an important reason for the observed decreases in drug use.

The military population in 1988 is slightly older, more likely to be married, and better educated than in 1980. When the drug use rates among total DoD personnel in 1988 were standardized by age, education, and marital status to rates of earlier years, they did not alter the significance of observed differences from 1980 to 1988 observed for the unstandardized rates. Thus, changes in the sociodemographic composition of the military population is not a viable reason for the decreases in drug use between 1980 and 1988.

- Decreases in any drug use observed for total DoD were seen for each of the Services between 1980 and 1988, but not all of the decreases were statistically significant between 1985 and 1988.

Any drug use in each of the Services also declined significantly between 1980 and 1988, as shown in Figure 9 and Table A.3 (Appendix A). Drug use was consistently lower among Air Force personnel, although by 1988 the gap between the Services had narrowed considerably. Not all of the decreases for the Services were statistically significant between 1985 and 1988. Decreases in any drug use, marijuana use, and drug use except marijuana were significant for Army and Navy personnel, and each of the declines was significant for Air Force personnel except for drugs other than marijuana. Although only marginally significant, the declines in any drug use, marijuana use, and any drug use except marijuana for Marine Corps

Figure 9. Trends in Any Drug Use Past 30 Days, by Service, 1980-88



personnel were substantial. Standardization of the 1988 rates to the 1985 age/marital status/education distribution for each Service revealed that change in the sociodemographic composition of the Services between 1985 and 1988 was not an important reason for the observed differences.

- Drug use during the 1980s was consistently lower among Air Force personnel than among personnel in the other Services, and differences in the sociodemographic composition of the Services partially explain the observed Service differences.

For each Service, 1988 estimates for any drug use, marijuana use, and any drug use except marijuana were standardized to the demographic composition of the total DoD. Drug use among Air Force personnel was significantly lower than for each of the other Services, based on unstandardized rates, but standardization narrowed the gap between the Air Force and Marine Corps estimates by increasing the Air Force estimates and decreasing the Marine Corps estimates. Thus, standardized rates show that drug use among Air Force personnel is significantly lower than among Army or Navy personnel, but no longer lower than among Marine Corps personnel. This suggests that a major part of the Air Force/Marine Corps difference was associated with demographic differences between the two Services, but other Service differences are not.

B. Prevalence of Use of Specific Drugs

- Marijuana is the most commonly used drug.

As overall drug use declined, use of each of the specific drugs or types of drugs considered in this survey also declined. Table 4 shows percentages who used 11 specific drugs or drug classes during the 30 days or 12 months before the survey. As shown, marijuana is the most commonly used drug, used by 2.7 percent of military personnel during the past month and 6.1 percent within the past year. Thirty-day use of each of the other drugs is less than 1 percent, except for analgesics, which is 1.1 percent; 12 month use is generally less than 2 percent except for cocaine which was used by 2.5 percent of military personnel during the past year. "Designer drugs" were added to the questionnaire in 1988. These drugs are chemical variations of psychoactive drugs. These drugs were used by very few military personnel, 0.2 percent during the past 30 days and 0.6 percent during the past 12 months.

- The use of all specific drugs declined between 1985 and 1988.

The use of all individual drugs declined between 1985 and 1988, including marijuana, cocaine, amphetamines, barbiturates/sedatives, and other classes of drugs. For instance, cocaine use declined from 2.4 percent during the past 30 days in 1985 to 0.9 percent in 1988.

- Most drug users use drugs infrequently.

Use 1 to 3 times per month is the most common pattern of use for all military personnel, although E1s to E3s are more likely than other personnel to be users and frequent users.

C. Drug Use and Pay Grade

- Drug use is highest among junior enlisted personnel.

Much of the drug use in the military is concentrated among personnel in the lower pay grades. The percentages of users of any drug during the past 30 days and past 12 months for pay grade groupings are presented in Figure 10 and Table A.4 (Appendix A). As shown, the use of any drug during the past 30 days and past 12 months occurs primarily among the lower enlisted pay grades. For the past 30 days, 8.9 percent of E1s to E3s and 5.1 percent of E4s to E6s report drug use compared with about 1 percent of personnel in other pay grades. The pattern of findings is similar for 12-month use.

- Drug use among junior enlisted personnel is higher in the Army and the Navy.

All Services show the same pattern of findings noted for total DoD with E1s to E3s having the highest prevalence rates followed by E4s to E6s. Figure 11 and Table A.4 show Service comparisons of drug use rates for E1s to E3s. Results show that use among E1s to E3s is highest among Army personnel followed by Navy, Marine Corps, and Air Force. Sixteen percent of E1s to E3s in the Army reported using one or more drugs during the past 30 days, and 28.4 percent reported abuse of drugs in the past year. Among E1s to E3s in the Navy, 9.7 percent reported 30-day use, and 24.0 percent indicated 12-month use. Among E1 to E3s in the Marines, 6.5 percent reported 30-day use and 10.5 percent reported 12-month use. Among E1 to E3s in the

Table 4. Nonmedical Drug Use During the Past 30 Days and the Past 12 Months

Drug/Period of Use	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
<u>Marijuana</u>					
Past 30 Days	4.4 (0.5)	3.5 (0.5)	1.4 (0.5)	0.5 (0.2)	2.7 (0.3)
Past 12 Months	8.9 (1.0)	7.9 (1.6)	4.7 (0.9)	1.7 (0.5)	6.1 (0.6)
<u>Cocaine</u>					
Past 30 Days	1.5 (0.3)	0.9 (0.2)	1.1 (0.5)	0.2 (0.1)	0.9 (0.1)
Past 12 Months	3.0 (0.4)	4.2 (1.4)	2.0 (0.8)	0.5 (0.2)	2.5 (0.5)
<u>PCP</u>					
Past 30 Days	0.2 (0.1)	0.1 (**)	0.1 (0.1)	0.1 (0.1)	0.1 (**)
Past 12 Months	0.3 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (**)
<u>LSD/Hallucinogens</u>					
Past 30 Days	0.6 (0.1)	0.5 (0.3)	0.3 (0.1)	** (**)	0.4 (0.1)
Past 12 Months	1.7 (0.5)	2.3 (0.9)	0.7 (0.2)	0.1 (**)	1.3 (0.3)
<u>Amphetamines/Stimulants</u>					
Past 30 Days	1.0 (0.2)	1.0 (0.2)	1.3 (0.3)	0.2 (0.1)	0.8 (0.1)
Past 12 Months	1.6 (0.3)	2.5 (1.0)	2.2 (0.5)	0.6 (0.2)	1.6 (0.3)
<u>Tranquilizers</u>					
Past 30 Days	0.6 (0.1)	0.3 (0.2)	0.3 (0.2)	0.3 (0.1)	0.4 (0.1)
Past 12 Months	0.8 (0.1)	0.9 (0.2)	0.5 (0.2)	0.5 (0.1)	0.7 (0.1)
<u>Barbiturates/Sedatives</u>					
Past 30 Days	0.4 (0.1)	0.5 (0.2)	0.1 (0.1)	0.1 (0.1)	0.3 (0.1)
Past 12 Months	0.8 (0.3)	0.7 (0.3)	0.4 (0.2)	0.1 (0.1)	0.6 (0.1)
<u>Heroin/Other Opites</u>					
Past 30 Days	0.3 (0.1)	0.1 (**)	0.1 (0.1)	** (**)	0.1 (**)
Past 12 Months	0.3 (0.1)	0.4 (0.2)	0.1 (0.1)	** (**)	0.2 (0.1)
<u>Analgesics</u>					
Past 30 Days	1.1 (0.2)	1.3 (0.4)	0.9 (0.3)	1.1 (0.2)	1.1 (0.1)
Past 12 Months	1.9 (0.3)	1.9 (0.4)	1.8 (0.2)	1.6 (0.2)	1.8 (0.2)
<u>Inhalants</u>					
Past 30 Days	0.8 (0.2)	0.9 (0.2)	0.6 (0.2)	0.3 (0.1)	0.7 (0.1)
Past 12 Months	1.3 (0.3)	1.2 (0.2)	0.7 (0.2)	0.5 (0.1)	1.0 (0.1)
<u>"Designer" Drugs</u>					
Past 30 Days	0.2 (0.1)	0.4 (0.2)	0.4 (0.3)	0.1 (**)	0.2 (0.1)
Past 12 Months	0.5 (0.1)	1.1 (0.8)	0.5 (0.4)	0.2 (0.1)	0.6 (0.3)
<u>Any Drug^a</u>					
Past 30 Days	6.9 (0.7)	5.4 (0.7)	4.0 (0.7)	2.1 (0.4)	4.8 (0.3)
Past 12 Months	11.8 (1.1)	11.3 (2.1)	7.8 (1.0)	3.8 (0.6)	8.9 (0.8)
<u>Any Drug Except Marijuana^b</u>					
Past 30 Days	3.9 (0.4)	3.4 (0.4)	3.6 (0.3)	1.9 (0.3)	3.1 (0.2)
Past 12 Months	6.9 (0.7)	8.1 (1.8)	5.9 (1.1)	2.9 (0.4)	5.9 (0.7)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses.

^aNonmedical use one or more times of any drug or class of drugs listed in the table.

^bNonmedical use one or more times of any drug or class of drugs listed in the table excluding marijuana.

**Estimate rounds to zero.

Figure 10. Any Drug Use by Pay Grade, Total DoD

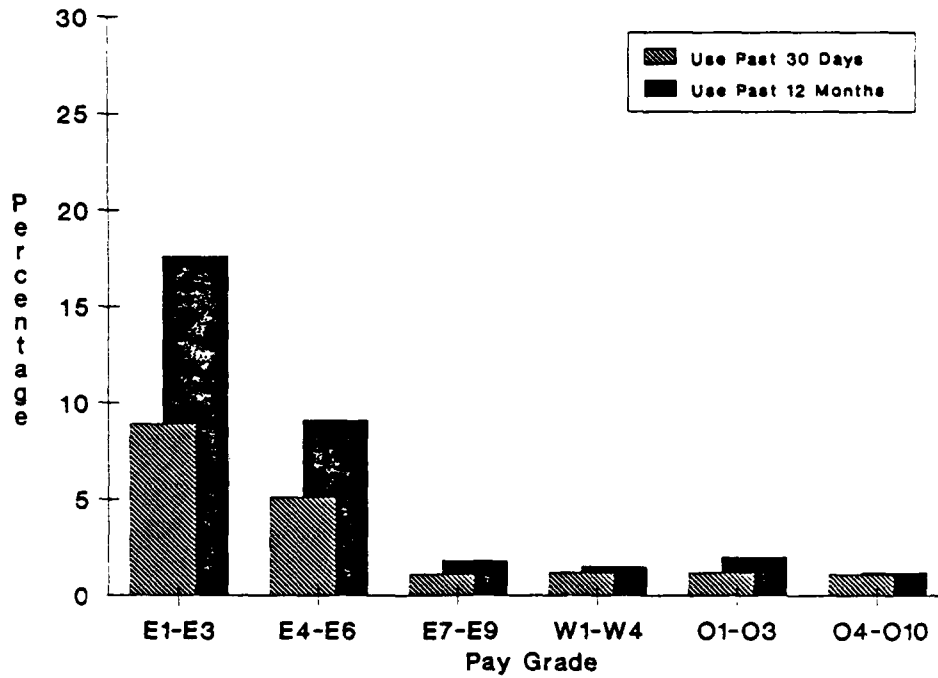
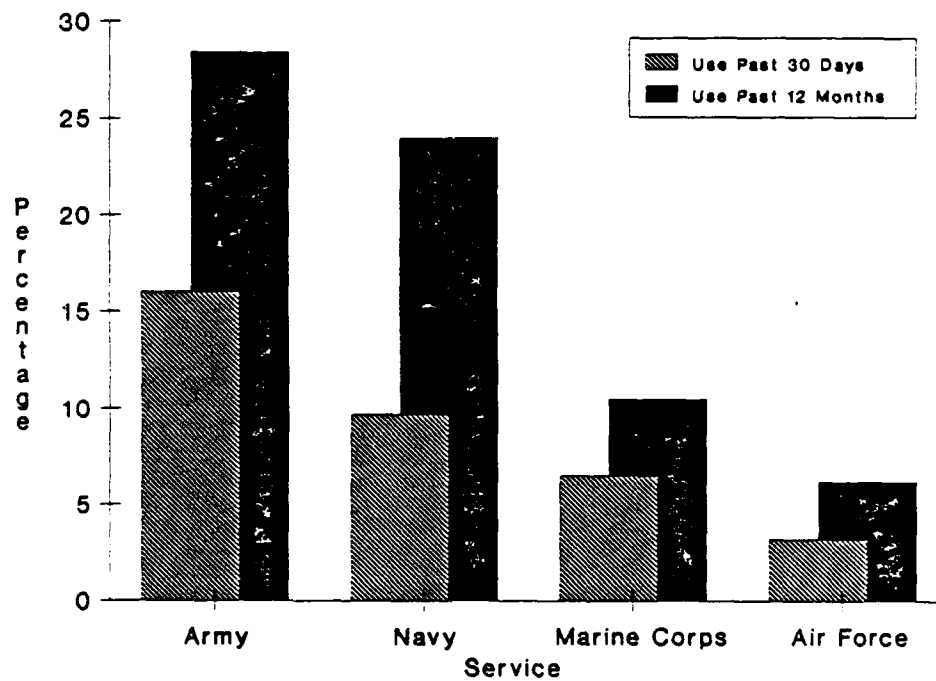


Figure 11. Any Drug Use for E1-E3s by Service



Air Force, 3.2 percent reported 30-day use, and 6.2 percent reported 12-month use.

The finding that drug use prevalence is highest among junior enlisted personnel agrees with findings of prior Worldwide Surveys. The findings suggest that prevention, intervention, and treatment efforts should be closely targeted to personnel in the lower pay grades.

D. Correlates of Drug Use

- Controlling for effects of other factors, drug use is significantly associated with sociodemographic characteristics and attitudinal/behavioral factors.

A regression analysis was conducted for enlisted personnel predicting any drug use during the past 12 months. Independent variables were Service, race/ethnicity, sex, education, family status, region, pay grade, age, reported stress at work, health practices, beliefs about the harmful effects of drugs, beliefs about drug testing effectiveness, drug treatment climate, and attitudes toward marijuana use. Detailed definitions of the analysis and variables appear in the final report (Bray et al., 1988).

Results showed that drug use among enlisted personnel is strongly predicted by beliefs about the harmful effects of drugs, health practices, Service, race/ethnicity, and family status. The probability of being a drug user is significantly more likely among enlisted personnel who do not believe drug use is harmful, who engage in poor health practices, who are in the Army or the Navy, who are white, and who are single or married but unaccompanied by their spouse.

The strong influence of the belief variables suggests that continued emphasis should be placed on education efforts that inform military personnel about the harmful effects of nonmedical drug use and emphasize the importance of following good health practices.

- Drug use is not strongly related to reported stress at work.

Enlisted personnel who report being under a great deal of stress at work are slightly more likely to report drug use than those who report no stress at work. Thus, the relationship exists, but is not strong. There is no such tendency for officers.

In sum, drug use among military personnel declined dramatically between 1980 and 1988 and is now the lowest since the survey series began. The declines are related to similar declines among civilians, but they also demonstrate the continuing effectiveness of military efforts to eliminate drug use among military personnel.

6. TOBACCO USE

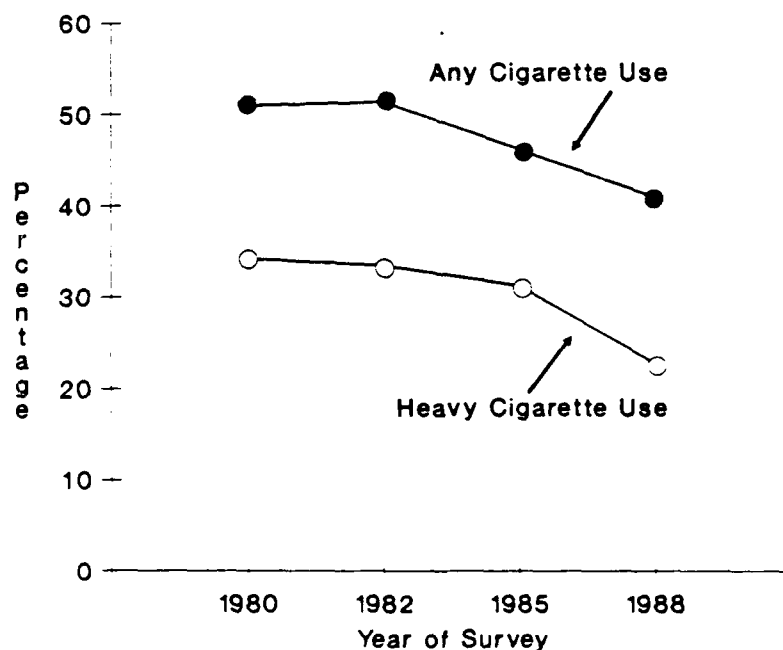
In 1964, when the Surgeon General's report was released, almost 45 percent of adults smoked cigarettes on a regular basis, but by 1985 this figure had decreased to about 30 percent. Smoking rates for men decreased more rapidly than for women. Consumption of smokeless tobacco products (snuff and chewing tobacco), however, increased rapidly during the 1970s, and by 1985 the prevalence of use among adult men and women was 19 percent and 3 percent, respectively.

A. Trends in Cigarette Use

- Any cigarette smoking and heavy smoking decreased significantly for all military personnel between 1980 and 1988.

Figure 12 and Table A.5 (Appendix A) present trends between 1980 and 1988. As shown in Figure 12, any cigarette use declined from 51.0 percent in 1980 to 40.9 percent in 1988. Heavy smoking (smoking 1 or more packs a day) declined from 34.2 percent in 1980 to 22.7 percent in 1988. Both any smoking and heavy smoking were relatively stable between 1980 and 1982 but declined significantly after 1982. It is likely that these trends reflect societal trends toward lower rates of smoking as well as the increased emphasis on smoking cessation and prevention within the military.

Figure 12. Trends in Cigarette Use, Past 30 Days, Total DoD, 1980-88



- Trends in any cigarette smoking and heavy smoking observed for total DoD were seen for each of the Services.

Service trends in any smoking between 1980 and 1988 are illustrated in Figure 13 and for heavy smoking in Figure 14. Any cigarette smoking and heavy smoking declined significantly for each of the Services between 1980 and 1988, and heavy smoking declined significantly for each of the Services between 1985 and 1988. Although any cigarette use declined for each of the Services between 1985 and 1988, only the decrease for the Army was statistically significant.

- The percentages of smokers and heavy smokers have in general been lower among Air Force personnel, but these Service differences are only partially accounted for by differences in the sociodemographic composition of the Services.

As shown in Figure 13, the percentage of smokers among Air Force personnel has been consistently lower than among personnel in the other Services. As shown in Figure 14, however, the percentage of heavy smokers among Air Force personnel was lowest in 1980 and 1982, but the percentage of heavy smokers among Marine Corps personnel was slightly lower than among Air Force personnel in 1985 and 1988. Unstandardized estimates of the percentage of smokers in 1988 showed that rates were similar among Army, Navy and Marine Corps personnel, but those rates were significantly different from the Air Force. Standardization of the Service rates to the age/

Figure 13. Trends in Any Cigarette Use, Past 30 Days
by Service, 1980-88

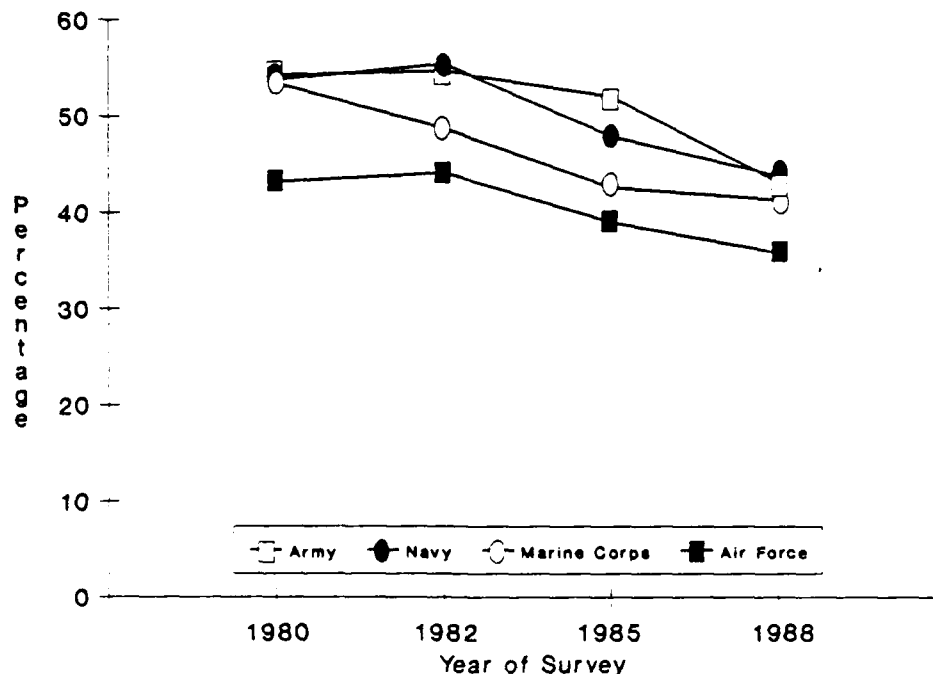
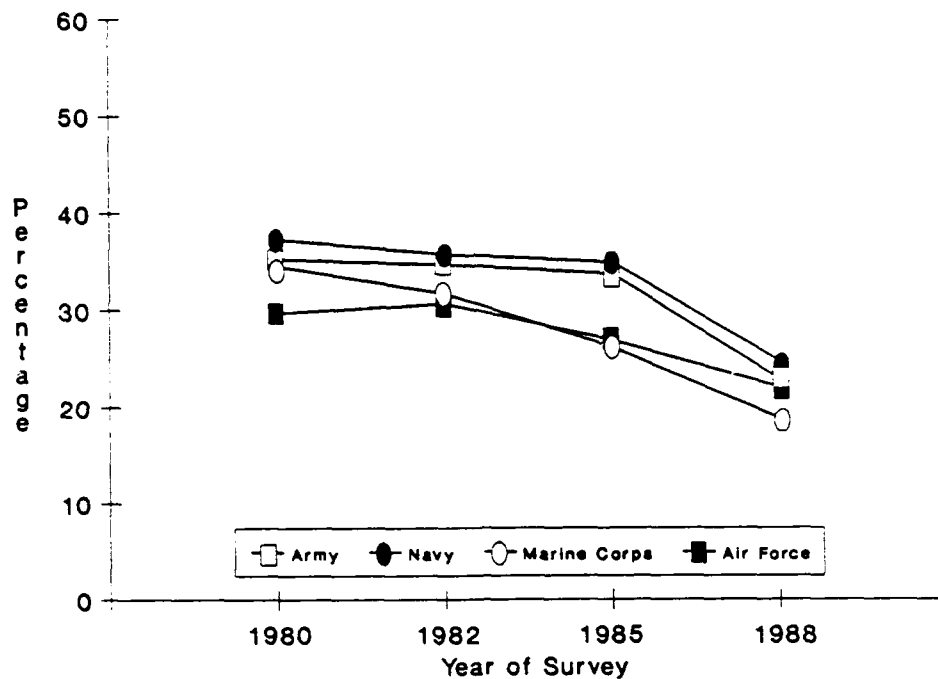


Figure 14. Trends in Heavy Cigarette Use, Past 30 Days
by Service, 1980-88



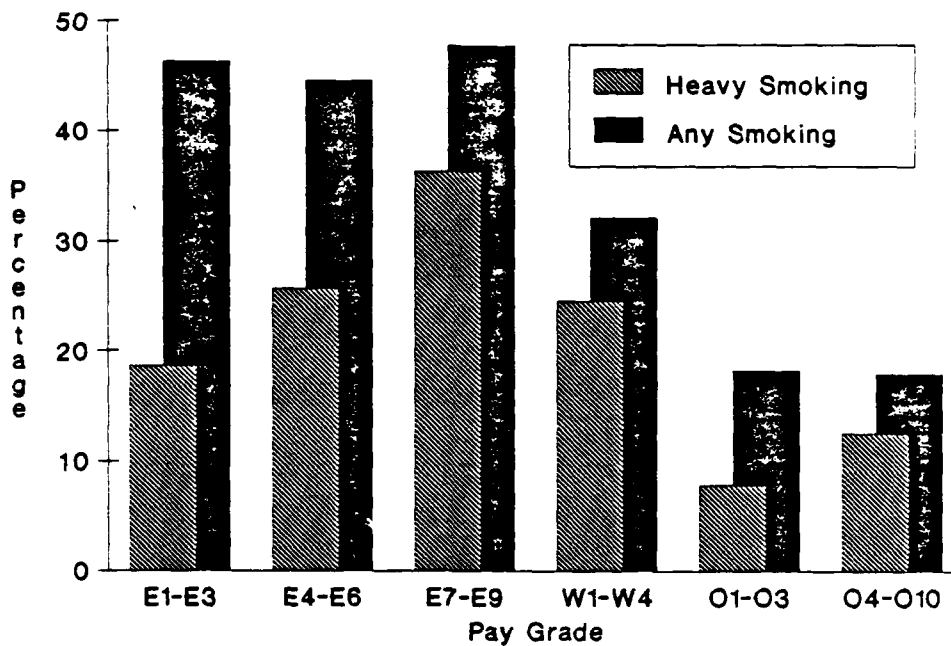
marital status/education distribution of the total DoD revealed no significant difference between the Marine Corps and Air Force. For heavy smoking, the unstandardized rates among the Services were not significantly different, but the standardized rates for the Marine Corps and Navy were significantly different. These findings suggest that part of the observed Service differences in smoking and heavy smoking are accounted for by differences in sociodemographic composition of the Services.

B. Cigarette Smoking and Pay Grade

- The prevalence of smoking is substantially higher among enlisted personnel than officers, and within enlisted and officer ranks, greater percentages of heavy smokers are found among the higher pay grades.

Figure 15 and Table A.6 (Appendix A) present data on cigarette use by pay grade. For the total DoD, the prevalence of any smoking is substantially higher among enlisted personnel (44.5 percent to 47.7 percent for the enlisted pay grades) than among officers (about 18 percent for commissioned officers and 32.1 percent for warrant officers). Among enlisted personnel, E7s to E9s have more heavy smokers (36.3 percent) than E4s to E6s (25.6 percent) and E1s to E3s (18.6 percent); among officers, those in O4 to O10 pay grades have more heavy smokers (12.5 percent) than those in the more junior O1 to O3 pay grades (7.8 percent). This finding for heavy smokers may reflect more recent societal trends toward reduced smoking which could be expected to have a greater influence on younger personnel.

Figure 15. Cigarette Use by Pay Grade, Total DoD



C. Prevalence of Other Tobacco Use

- For the total DoD, 24.0 percent smoke a cigar or pipe and 17.3 percent use smokeless tobacco.

Table 5 presents data on prevalence of cigar/pipe and smokeless tobacco use. As shown, many military personnel use forms of tobacco other than cigarettes. The percentage smoking cigars or a pipe was relatively stable between 1985 and 1988, but the percentage using smokeless tobacco had declined. Enlisted personnel are more likely than officers to smoke cigars or a pipe and to use smokeless tobacco, and current smokers show the highest rates of other tobacco use.

Table 5. Prevalence of Cigar, Pipe, and Smokeless Tobacco Use, Past 12 Months

Tobacco Type	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Cigars/Pipe	22.9 (1.0)	25.9 (2.0)	32.9 (3.1)	20.7 (0.8)	24.0 (0.8)
Smokeless Tobacco	18.7 (1.3)	16.1 (1.5)	32.7 (4.8)	12.5 (1.2)	17.3 (0.8)

Note: Entries are percentages with standard errors in parentheses.

Table 5 shows that cigars and pipes are smoked most commonly by Marines, followed by Navy, Army, and Air Force personnel. Use of smokeless tobacco is also highest in the Marine Corps.

D. Correlates of Smoking

- Controlling for the effects of other factors, any cigarette smoking and heavy smoking are significantly associated with sociodemographic characteristics and attitudinal behavioral variables.

Two regression analyses were conducted to examine the correlates of any cigarette smoking and of heavy smoking. Independent variables in each of the analyses were Service, race/ethnicity, sex, level of education, family status, region, pay grade, age, years of service, health practices, and reported stress at work.

Results showed that any smoking and heavy smoking are predicted by pay grade, race/ethnicity, education, Service, age, poor health practices, and higher stress at work. The probability of being a smoker or a heavy smoker is significantly higher among military personnel who are in enlisted pay grades, who are white, who did not continue their education beyond high school, who are in the Army compared with the Air Force, who follow poorer health practices, and who report higher levels of stress at work.

E. Military Job and Smoking

- Cigarette smoking is more likely among those who report being under a great deal of stress at work than among those who report being under no stress.

Among those who report being under a great deal of stress at work, 48.3 percent are smokers and 28.2 percent are heavy smokers; among those who report being under no stress at work, 34.7 percent are smokers and 16.3 percent are heavy smokers. This relationship is more pronounced for enlisted personnel than officers.

F. Tobacco Use After the No Smoking Policy

- Among those who have smoked within the past 2 years, 62 percent have tried to stop smoking and about one-fifth have succeeded.

Almost 38 percent of military personnel have never smoked, 21.4 percent are former smokers, and 41.0 percent are current smokers. Table 6 examines efforts to quit cigarette smoking since 1986 when the DoD no smoking policy was initiated. As shown, among those who smoked within the past 2 years, 13.1 percent tried to quit and were successful, 49.0 percent tried to quit and were not successful, and 37.9 percent did not try to quit. Only 2.2 percent of military personnel started using smokeless tobacco after the issuance of the 1986 smoking prevention and cessation guidelines.

In sum, cigarette smoking among military personnel declined substantially since 1980, particularly since 1985. These declines in part reflect

Table 6. Serious Attempt to Stop Smoking Cigarettes Among Smokers
During the Past 2 Years

Status	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Former smoker, quit within past 2 years	18.9 (0.7)	13.8 (1.4)	15.6 (1.0)	15.2 (1.3)	13.1 (0.6)
Current smoker, tried to quit	49.1 (1.2)	49.3 (1.7)	51.3 (2.2)	47.7 (1.9)	49.0 (0.8)
Current smoker, didn't try to quit	40.0 (1.3)	37.7 (1.1)	33.1 (1.9)	37.1 (1.3)	37.9 (0.7)

Note: Entries are column percentages with standard errors in parentheses.

similar declines among civilians but also reflect the effectiveness of military smoking cessation and prevention programs. The majority of smokers (62.1 percent) have attempted to quit since the military "no smoking" policy began 2 years ago, and of those who tried to quit 21.1 percent have been successful.

7. NEGATIVE EFFECTS OF ALCOHOL AND DRUG USE

Alcohol use and drug use can have substantial negative effects on the work performance, health, and social behavior of military personnel. These negative effects can diminish military readiness and compromise our nation's security. A recent civilian survey found that 13.3 percent of men and 7.1 percent of women reported having experienced an alcohol-related problem over the past year; 18.8 percent of men and 8.2 percent of women reported a dependence symptom. Compared with findings from civilian surveys almost 20 years ago, the percentages reporting alcohol-related problems has remained relatively stable, while the percentage reporting dependence symptoms has increased. Less is known about drug-related negative effects.

A. Trends in Negative Effects of Alcohol Use

- Alcohol-related negative effects have declined significantly since 1980.

Figure 3 and Table A.7 (Appendix A) show trends in negative effects due to alcohol use. In 1988, 9.0 percent of military personnel reported having experienced a serious consequence associated with alcohol use during the past year, 22.1 percent reported some productivity loss, and 6.4 percent one or more symptoms of dependence. Between 1980 and 1988, the decreases in each of the indicators were statistically significant. Between 1985 and 1988 only the decrease in productivity loss was statistically significant.

- Reductions in negative effects observed for total DoD were seen for personnel in each of the Services.

Figures 16, 17, and 18 and Table A.7 show Service trends in negative effects due to alcohol use. As shown in Figure 16, serious consequences declined significantly for each of the Services between 1980 and 1988. The Army declined from 17.9 percent to 10.3 percent, the Navy from 22.1 percent to 10.4 percent, the Marines from 26.2 percent to 17.0 percent, and the Air Force from 9.0 percent to 3.9 percent. The 1985-1988 declines for the Army, Navy, and Air Force in any serious consequences were not statistically significant. The 1985-1988 increase for Marine Corps personnel was also nonsignificant.

As shown in Figure 17, each of the Services showed an increase in productivity loss between 1980 and 1982 followed by a return roughly to 1980 levels in 1985. The most recent data for 1988 show that since 1985 declines in productivity loss were statistically significant for three of the Services (the Marine Corps showed an increase that was not statistically significant).

As shown in Figure 18, symptoms of alcohol dependence show a somewhat different pattern than serious consequences or productivity loss. For the Army, alcohol dependence increased from 8.8 percent in 1980 to 12.1 percent in 1985 and then declined significantly to 7.2 percent in 1988. For the Navy, dependence increased from 9.7 percent in 1980 to 11.6 percent in 1982 and then declined to 6.8 percent in 1985 and shifted to 7.2 percent in

Figure 16. Alcohol-Related Serious Consequences by Service, 1980-88

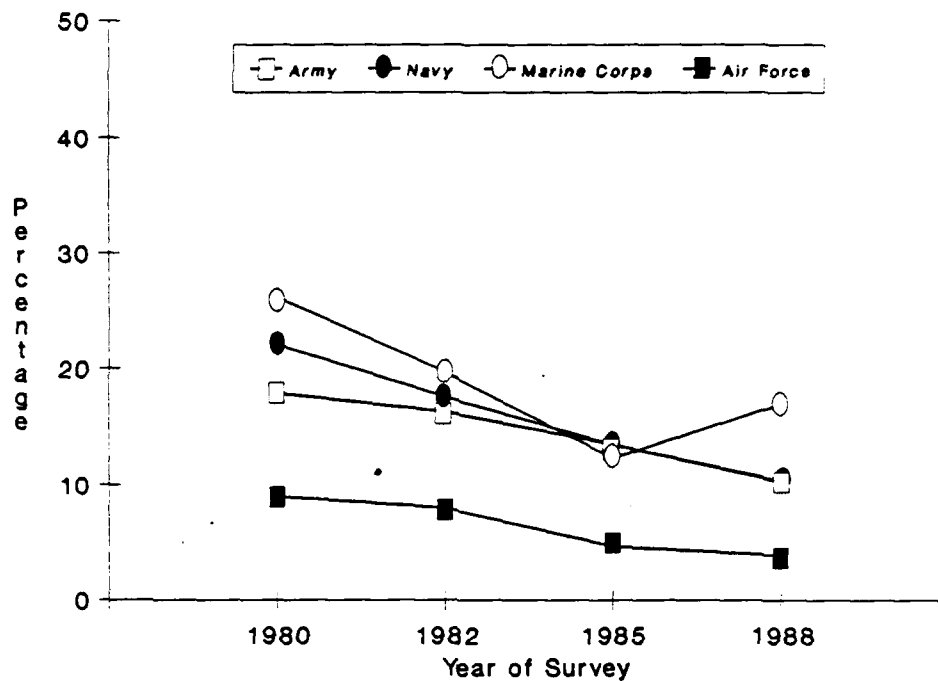


Figure 17. Alcohol-Related Productivity Loss by Service, 1980-88

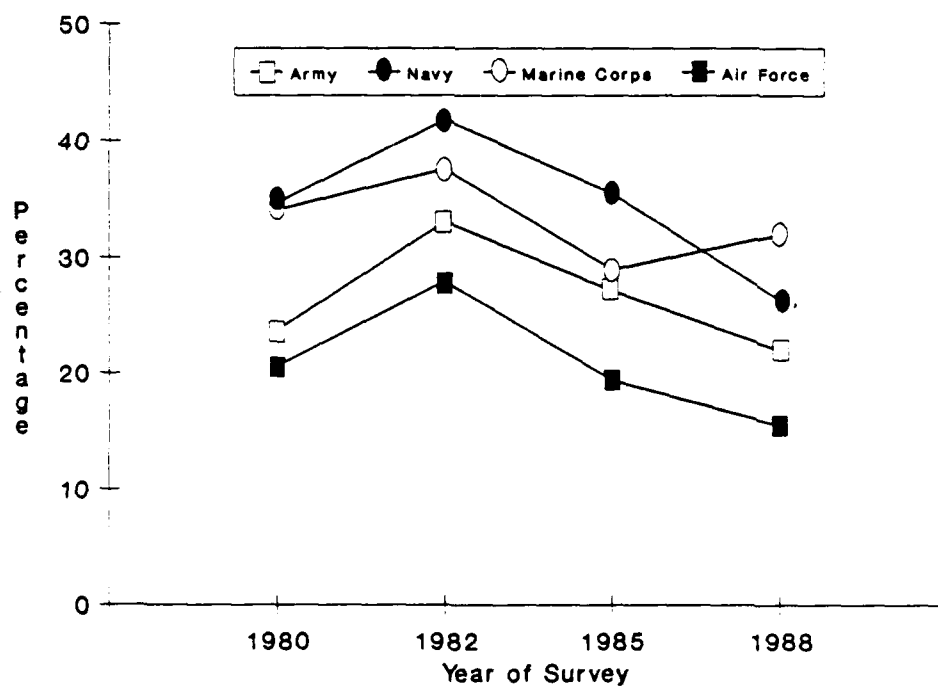
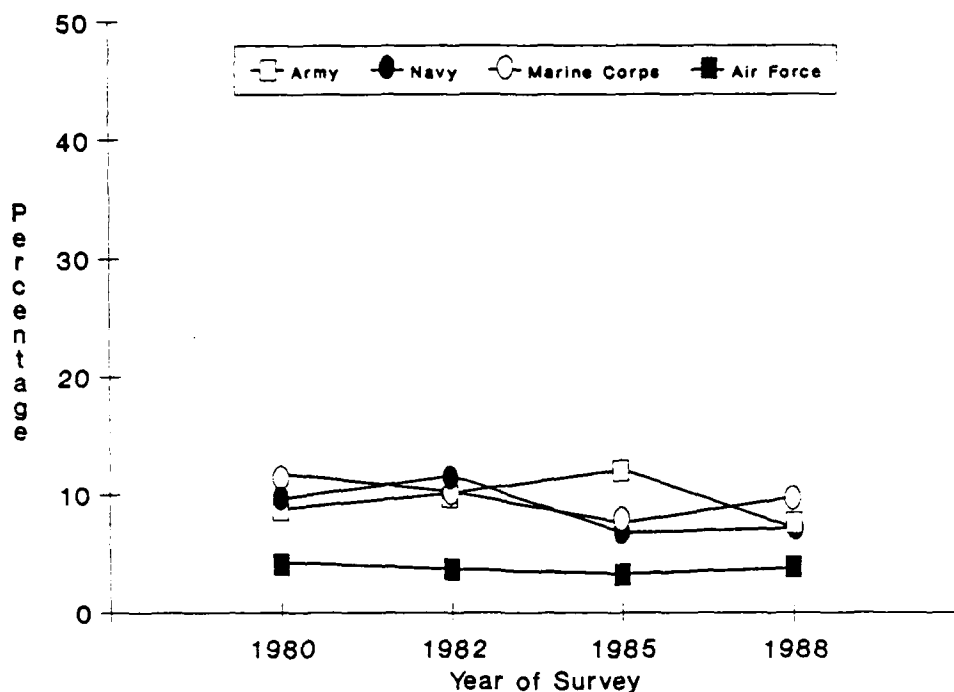


Figure 18. Alcohol-Related Dependence by Service, 1980-88



1988. For the Marines, dependence remained roughly stable from 1980 to 1982, then showed a decline in 1985 and a slight increase in 1988. Air Force personnel have had the fewest dependence symptoms throughout the 1980s, and this has not changed significantly since 1980. Between 1985 and 1988, only the Army showed a statistically significant decrease in the percentage reporting dependence symptoms.

B. Alcohol-related Negative Effects and Pay Grade

- Alcohol-related serious consequences, productivity loss, and alcohol dependence are higher among personnel in E1 to E3 pay grades than personnel in other pay grades.

Figures 19 and 20 and Table A.8 (Appendix A) show the relationship of negative effects to pay grade. As shown, for any serious consequences and alcohol dependence, rates for E1s to E3s are almost twice as high as those for E4s to E6s. For productivity loss, to E1 to E3 rates are about 10 percentage points higher. The prevalence of serious consequences and alcohol dependence for other pay grades is minimal, although about 10 percent of higher enlisted pay grades or officers other than warrant officers reported productivity loss during the year. Figure 20 shows that a substantial percentage of E1-E3s report negative effects. From 33.9 to 40.7 percent of Army, Navy, and Marine Corps personnel in pay grades E1 to E3 indicated some productivity loss in 1988. From 8.2 percent to 26.6 percent of E1-E3s indicate serious consequences. These percentages suggest that, while much has been done to curb the alcohol problem, substantial percentages of junior enlisted personnel report problems.

Figure 19. Alcohol Use Negative Effects by Pay Grade,
Total DoD, 1980-88

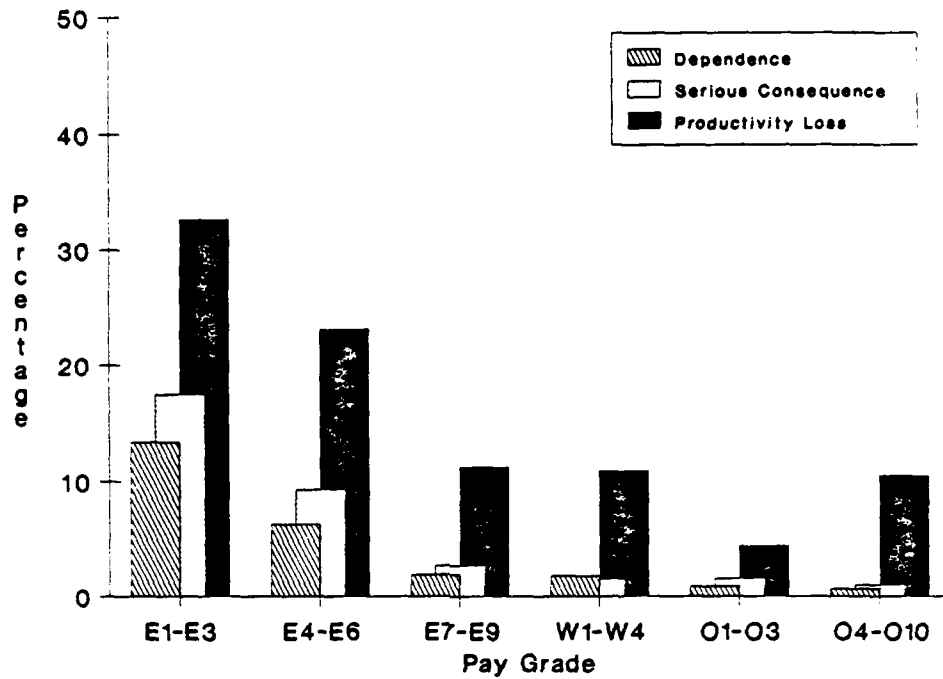
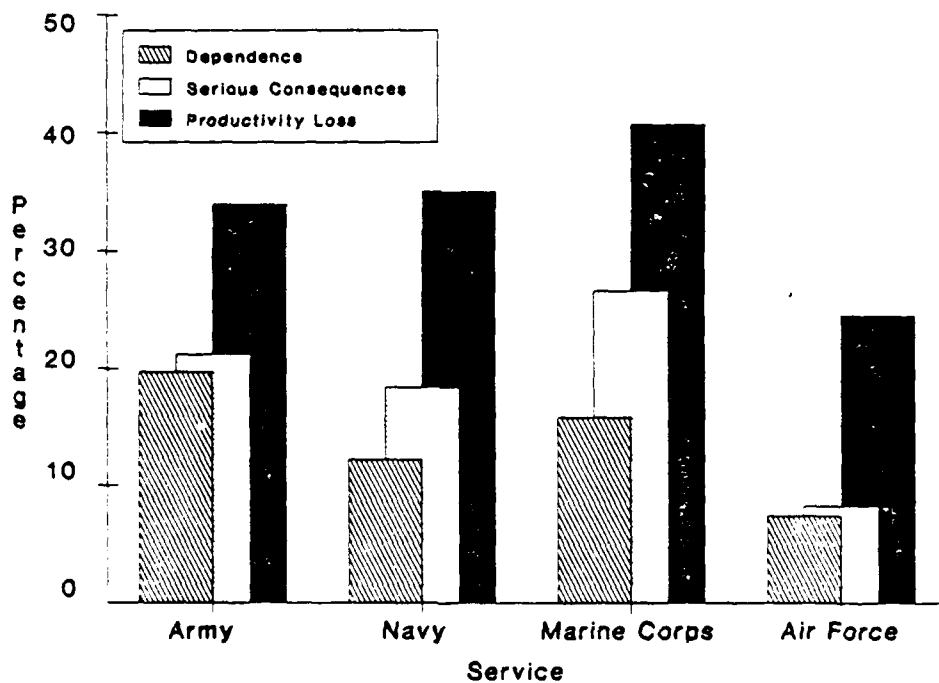


Figure 20. Alcohol Use Negative Effects for E1-E3s
by Service, 1980-88



C. Drinking Levels and Serious Consequences

- Drinking levels are positively related to serious consequences. Heavy drinkers experience the most consequences, and moderate drinkers report the fewest.

Negative effects of alcohol use remain a substantial problem for the military. To better understand the influence of drinking levels on serious consequences, a regression analysis was conducted predicting the number of serious consequences of alcohol use after controlling for other sociodemographic and psychological/behavioral variables. Independent variables were Service, race/ethnicity, sex, education, family status, region, pay grade, age, age of first regular use of alcohol, reported stress at work, drinking motivation, drinking climate, drinking attitudes, beliefs about heavy drinking, and drinking levels.

Results showed that drinking level is one of the most important predictors of serious consequences. Heavy drinkers on average experienced 1.50 serious consequences during the past 12 months compared with .52 consequences for moderate/heavy drinkers, .40 consequences for moderate drinkers, and .68 consequences for infrequent/light drinkers.

These findings suggest that education and prevention programs should target all drinkers because most experience some negative effects. Education programs for the smaller number of heavy drinkers, however, should also have a high impact because heavy drinkers experience many alcohol-related negative effects.

D. Trends in Negative Effects of Drug Use

- Drug-related negative effects decreased significantly since 1980.

Figure 4, Table A.9 (Appendix A), and Figures 21 and 22 present trend data on drug-related negative effects from 1980 to 1988. In 1980, 13.3 percent of military personnel reported a serious consequence associated with drug use. This declined to 1.8 percent in 1988. In 1980, 14.4 percent of personnel indicated some productivity loss due to drug use, and this declined to 2.1 percent in 1988. As shown in Figure 21, serious consequences declined for each of the services between 1980 and 1988. The Army declined from 14.4 percent to 1.0 percent, the Navy declined from 17.2 percent to 2.4 percent, the Marines declined from 19.4 percent to 1.9 percent, and the Air Force declined from 6.1 percent to 0.3 percent. As shown in Figure 22, productivity loss also declined for each of the Services in the same period. The Army declined from 15.7 percent to 2.4 percent, the Navy from 18.8 percent to 3.1 percent, the Marines from 20.8 percent to 3.0 percent, and the Air Force from 6.4 percent to 0.4 percent. All Services show significant declines in negative effects between 1980 and 1988. The decreases in serious consequences between 1985 and 1988 were statistically significant, as were the decreases between 1980 and 1985.

Figure 21. Drug-Related Serious Consequences by Service, 1980-88

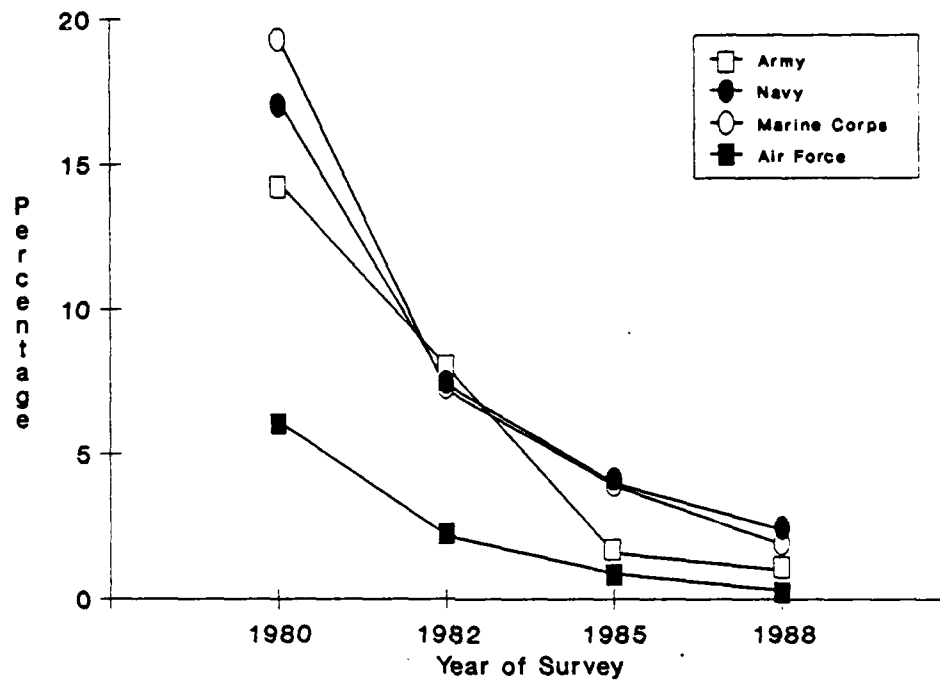
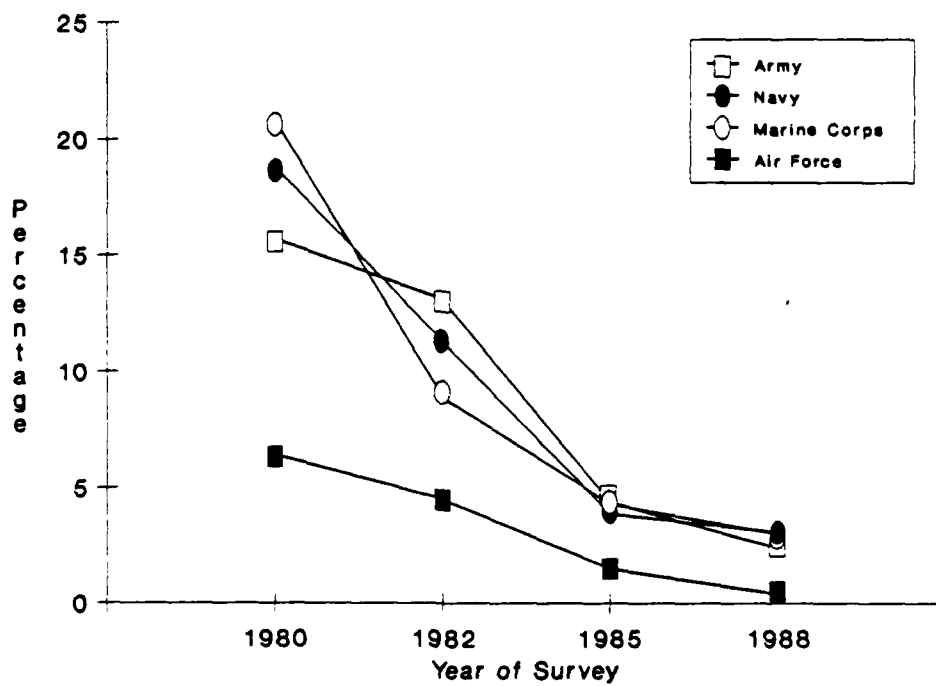


Figure 22. Drug-Related Productivity Loss by Service, 1980-88

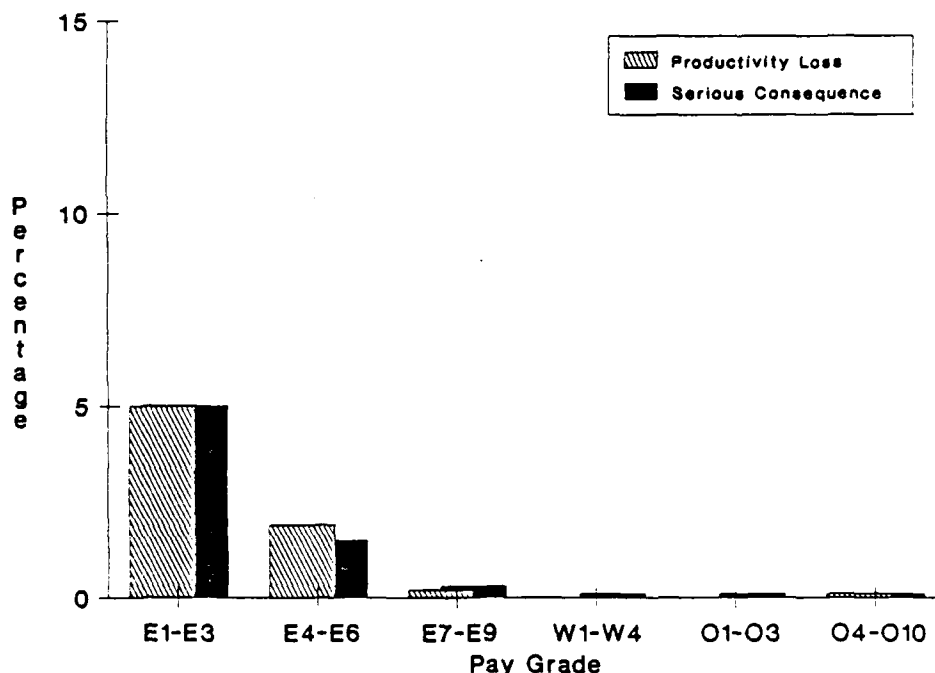


E. Drug-related Negative Effects and Pay Grade

- Drug-related negative effects and productivity loss are several times higher among E1 to E3s than E4s to E6s and minimal among the other pay grades.

As shown in Figure 23 and Table A-10 (Appendix A), about 5 percent of military personnel in pay grades E1 to E3 report any serious consequences or loss of productivity. Less than 2 percent of E4s to E6s and 0.3 percent or fewer of other pay grades report this. Figure 24 and Table A-10 show that, among E1-E3s, serious consequences due to drug use are highest in the Army (9.9 percent) followed by the Navy (6.2 percent), Marine Corps (3.4 percent), and Air Force (0.3 percent). Productivity loss is highest in the Army (8.3 percent) and Navy (7.7 percent) followed by the Marine Corps (3.6 percent), and the Air Force (0.3 percent).

Figure 23. Drug Use Negative Effects by Pay Grade, Total DoD, 1980-88

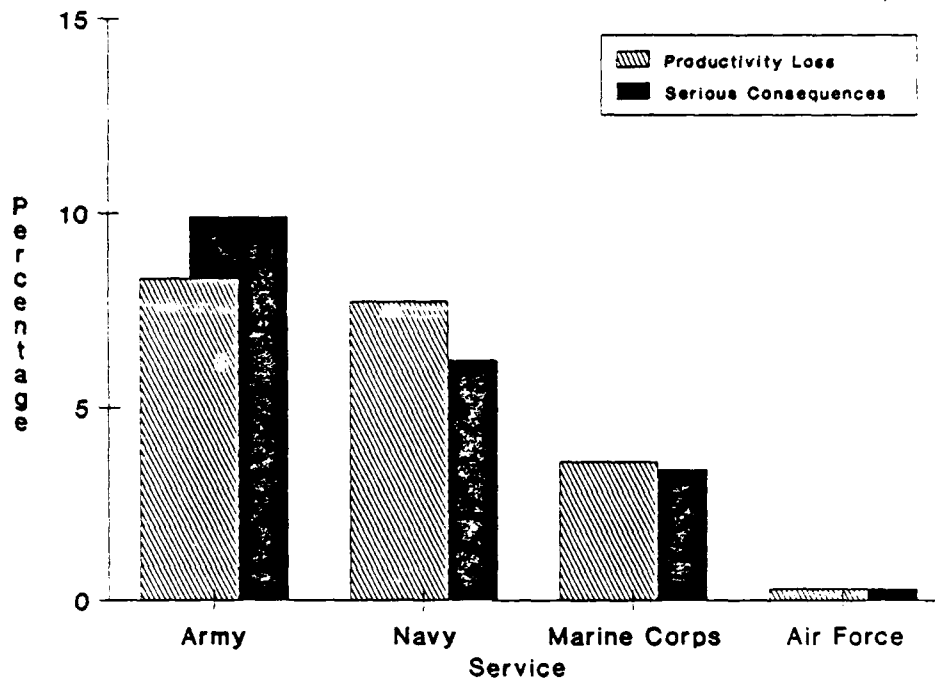


F. Drug Use Patterns and Serious Consequences

- Drug use patterns are positively related to serious consequences. Users of drugs other than marijuana report significantly more serious consequences than users of marijuana only.

To better understand the influence of drug use patterns on serious consequences, a regression analysis was conducted predicting serious consequences of drug use after controlling for other sociodemographic and psychological/behavioral variables. Independent variables in the analysis were Service, race/ethnicity, sex, education, family status, region, pay

Figure 24. Drug Use Negative Effects for E1-E3s by Service, 1980-88



grade, age, age of first regular use of marijuana, reported stress at work, beliefs about the harmful effects of drugs, drug treatment climate, attitudes toward marijuana use, and drug use pattern. The results showed that drug use patterns is one of the most important predictors of serious consequences. Users of drugs other than marijuana only experienced an average of 1.18 serious consequences during the past 12 months compared with .43 serious consequences for marijuana only users.

Drug use in the military remains a problem due to its illegal status. Aside from this issue, many personnel, particularly in pay grades E1 to E3, experienced serious negative consequences associated with drug use. These problems are particularly apparent for users of drugs other than marijuana. This suggests that prevention efforts should continue to emphasize undesirable consequences that result from drug use in addition to the unacceptability and illegal status of drug use.

G. Substance Use and General Negative Behaviors

- Heavier levels of drinking and drug use are associated with greater involvement in general negative behaviors. Heavy drinkers experienced significantly more negative behaviors than abstainers, and users of other drugs besides marijuana experienced significantly more negative behaviors than non-users.

Another approach to examining negative effects and alcohol and drug use is to ask respondents about negative events that happen to them without any attribution as to the reason and then to test for an association of these events and substance use.

The relationship of substance use and negative behaviors was examined with a regression analysis that predicted general negative behaviors controlling for effects of other variables. Independent variables in the regression model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, reported stress at work, drinking level, and drug use pattern. Drinking level and drug use patterns were two of the most important predictors of negative behaviors. Heavier levels of drinking and drug use were associated with a greater occurrence of general negative behaviors. Heavy drinkers experienced an average of 6.71 negative behaviors, and abstainers experienced only 4.43. Users of other drugs experienced 8.62 negative behaviors, marijuana-only users experienced an average of 5.78 negative behaviors, and nonusers experienced 4.81 negative behaviors.

In sum, negative effects due to alcohol use and drug use have declined significantly among military personnel since 1980. These declines are consistent with declines in alcohol and drug use during this period. Heavy drinkers and users of drugs other than marijuana are at high risk for experiencing negative effects.

8. SUBSTANCE USE AND HEALTH

The use of alcohol, drugs, or tobacco can negatively affect health. Alcohol, drugs, and tobacco have short- and long-term consequences for health and well-being, including increased morbidity and mortality and an increased risk of unintentional injuries. Substance users are also less likely than nonusers to be involved in health practices that foster good health. Health promotion programs seek to discourage those behaviors that threaten good health, including smoking, alcohol and drug use, poor nutrition, and poor eating habits, and encourage behaviors that improve current and future health status.

A. Health Status and Health Practices

- Almost all military personnel describe their health as good or excellent, and most indicators of health status support this assessment.

About 97 percent of military personnel describe their health as good or excellent, few report that their health has caused them any concern, and almost all had a satisfactory performance rating on their last physical readiness test.

- The average number of health practices increased between 1985 and 1988.

In 1985, military personnel reported they engaged in an average of 3.79 of six health practices and in 1988, 3.91, a small but significant increase. These health practices include moderate alcohol use or less, nonuse of drugs, never smoking, regular exercise, eating meals regularly, and adequate sleep. Table 7 presents a summary of selected health behaviors and shows that the prevalence of health practices and other health behaviors for the Services are very similar.

B. Nutrition, Stress, and Hypertension

- Almost 80 percent of military personnel took some action within the past year to improve their nutrition.

About half of military personnel stated they were eating more high fiber foods, eating fewer calories to lose weight, eating fewer foods with high fat content, and cutting down on fried foods; about 40 percent reduced the amount of salt in their diets or cut down on their use of alcohol. Military personnel believe that the most reliable nutrition information can be obtained from magazines, books, health food stores, nurses, doctors, or dietitians. As shown in Table 7, the percentage of personnel making changes in nutrition is similar for all of the Services.

- A majority of military personnel engage in functional activities to relieve stress, while one-third engage in certain less functional ways to relieve stress.

A majority of military personnel engage in functional stress management techniques such as thought or meditation, talking with others, or engaging

Table 7. Summary of Health Behaviors

Behavior	Service				Total Dod
	Army	Navy	Marine Corps	Air Force	
Health Practice Index ^a	3.99 (0.02)	3.78 (0.10)	3.92 (0.08)	3.95 (0.03)	3.91 (0.04)
Any Nutrition Changes ^b	77.2 (0.7)	79.8 (1.2)	75.9 (1.2)	80.7 (0.7)	78.9 (0.5)
Awareness of Blood Pressure Readings	50.1 (2.1)	54.7 (3.5)	44.1 (2.4)	57.5 (1.1)	53.1 (1.2)
Diagnosed as Hypertensive	12.7 (0.6)	11.7 (0.5)	12.9 (0.8)	11.3 (0.6)	12.0 (0.3)

Note: Entries for Health Practice Index are mean scores. Other entries are percentages. Standard errors are in parentheses.

^aFor the Health Practice Index, each respondent was credited one point for each health behavior: (1) Moderate alcohol use or less, (2) No drug use in the past 12 months, (3) Never smoked, (4) Exercise twice a week or more, (5) Eat two full meals a day at least, and (6) Sleep more than 8 hours a day at least 5 days a week.

^bAny Nutrition Changes are the percent of respondents who changed nutrition behavior in the following ways: (1) Eat fewer calories to lose weight, (2) Reduce amount of salt in diet, (3) Cut down on use of alcohol, (4) Eat more raw vegetables, whole wheat products and other high fiber foods, (5) Eat fewer foods with high fat content, and (6) Cut down on the amount of fried foods.

in leisure time activities. A sizeable percentage, however, engage in less functional activities such as smoking, drinking, sleeping, or buying something new.

- About 90 percent report having had their blood pressure checked during the past year, but only about one-half know what their readings were.

The fact that only about one-half know what their blood pressure readings are, although almost all were checked, suggests the need for education about hypertension and its prevention. About 12 percent report having been diagnosed as hypertensive. Table 7 shows that Marine Corps personnel are the least likely to be aware of their blood pressure readings.

C. Use of Alcohol, Drugs, and Cigarettes

- The use of alcohol, drugs, and tobacco are moderately inter-related.

Smokers are more likely than nonsmokers to drink and drink heavily and to use drugs. Similarly, drug users are more likely than nonusers to drink; however, drug users are less likely than nonusers to drink heavily. Thus, there is a moderately strong likelihood of using multiple substances, but drug users do not tend to be heavy drinkers.

D. Relationship Between Substance Use and Health

- The use of alcohol, drugs, and tobacco is implicated in poorer health outcomes.

As shown by Marsden, Bray, & Herbold (1988) in analyses of the 1985 Worldwide survey, heavy drinkers, users of drugs other than marijuana, and heavy smokers reported significantly more illnesses than nonusers during the year. To better understand the influence of substance use on illnesses, we conducted a regression analysis predicting the number of illnesses for the 1988 data after controlling for other sociodemographic and psychological/behavioral variables. Independent variables in the regression model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, years of service, reported stress at work, drinking levels, drug use patterns, and smoking patterns. Results show that number of illnesses during the past 12 months is significantly related to alcohol use, drug use, and cigarette use. The effects for drug use and smoking are clear: heavy users experience significantly more illnesses than nonusers. For drugs, users of drugs other than marijuana report an average of 4.17 illnesses compared with 3.32 illnesses for nonusers. Heavy smokers report 3.67 illnesses compared with 3.28 for nonsmokers. Findings are less clear for alcohol use. Heavy drinkers report significantly more illnesses (4.06) than moderate drinkers (2.98) but not more illnesses than abstainers (3.74). These findings show a relationship between substance use and health that is worthy of increased attention in prevention and intervention efforts.

In sum, these findings suggest that most military personnel enjoy good health but that there are some areas in which improvements can be made. Greater attention should be directed toward education about hypertension prevention and effective, functional stress management techniques. Further, the effects of substance use on health should be emphasized. Despite these problem areas, military personnel engage in health practices that are productive of good health, and they have made a number of changes in their behavior to improve their health status.

9. ATTITUDES TOWARD AIDS

The Department of Defense has implemented AIDS information programs to provide military personnel with information about AIDS transmission and prevention to attempt to reduce the risk of exposure. Military personnel are aware of the major means of transmission and prevention, but they have some misconceptions.

A. Beliefs About AIDS Transmission and Prevention

- Almost all military personnel know that AIDS can be transmitted by needle-sharing or having sex with someone who has AIDS, but many do not know about other means of transmission.

Table 8 presents data on beliefs about how AIDS is transmitted and how sexual transmission can be prevented. Over 95 percent of personnel know that AIDS can be transmitted by needle-sharing or sexually, over one-third believe that AIDS can be transmitted by receiving a blood transfusion, almost 20 percent by donating blood, about 11 percent by casual contact, and one-fourth by eating in a dining facility where the cook has AIDS. Officers tend to be much better informed than enlisted personnel.

- Most military personnel know how to prevent sexual transmission of AIDS.

As shown in Table 8, about 90 percent of military personnel believe that abstinence and monogamous sex are effective means of prevention, and about three-fourths believe that using a condom is effective. Over one-fourth, however, believe that asking sexual partners if they have the disease is effective, and 4 to 5 percent feel that a diaphragm or spermicides is effective. Officers are more knowledgeable than enlisted personnel.

B. AIDS Information Sources and Changes in Behavior with Awareness

- Almost all military personnel have received information about AIDS from newspapers or magazines and commercial TV or radio, and a majority have received information from military sources.

Military personnel are most likely to receive AIDS information from nonmilitary sources such as the mass media, but a majority also receive information from friends (73.6 percent) and pamphlets and brochures distributed by the Services (72.5 percent). Newspapers and magazines, commercial TV and radio, and literature distributed by the Services have been found to be useful by at least 65 percent of military personnel, but other sources are perceived to be less useful.

- Almost 40 percent of military personnel report having changed their sexual behavior because of concern about getting AIDS.

This finding indicates that many personnel know how AIDS is transmitted and are taking measures to prevent AIDS. Enlisted personnel are more

Table 8. Beliefs About How AIDS Is Transmitted and How Sexual Transmission Can be Prevented

Beliefs/Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
AIDS Transmission^a					
Receiving blood transfusion	40.2 (1.1)	32.1 (1.4)	35.9 (3.3)	30.8 (0.8)	34.8 (0.7)
Giving or selling blood	23.6 (1.1)	17.6 (1.4)	20.8 (3.0)	13.6 (1.0)	18.7 (0.7)
Working near someone with AIDS	10.5 (0.7)	8.1 (1.0)	12.3 (2.3)	6.7 (0.4)	8.8 (0.4)
Casual contact with someone with AIDS	13.3 (0.7)	9.7 (0.6)	13.1 (1.6)	8.0 (0.6)	10.7 (0.4)
Eating in dining facility where the cook has AIDS	27.6 (1.1)	23.7 (0.9)	32.2 (2.2)	20.2 (1.0)	24.7 (0.6)
Sharing needles with someone with AIDS	96.8 (0.4)	96.3 (0.4)	96.2 (0.9)	97.8 (0.4)	96.6 (0.2)
Having sex with someone with AIDS	96.3 (0.4)	95.8 (0.4)	95.6 (0.7)	97.0 (0.4)	96.0 (0.2)
AIDS Prevention^b					
Using a diaphragm	5.9 (0.6)	3.5 (0.3)	5.0 (0.5)	2.4 (0.3)	4.1 (0.2)
Using a condom	76.0 (0.9)	79.5 (0.8)	76.6 (0.7)	78.9 (1.3)	77.6 (0.6)
Using a jelly, foam, or cream to kill sperm	5.3 (0.5)	5.3 (0.9)	3.2 (0.6)	4.0 (0.5)	4.7 (0.4)
Not having sex at all	90.2 (0.6)	93.9 (0.7)	88.4 (1.6)	94.0 (0.6)	92.2 (0.4)
Two people having sex with only each other	87.0 (0.4)	87.5 (1.0)	88.8 (1.7)	89.1 (0.6)	87.9 (0.4)
Asking possible sex partners if they have the virus	30.8 (1.1)	25.7 (1.0)	30.8 (1.8)	26.0 (1.6)	27.9 (0.7)

Note: Table entries are percentages with standard errors in parentheses.

^aData are estimates of individuals who believe that AIDS "definitely will" or "probably will" be transmitted in the ways mentioned.

^bData are estimates of individuals who believe the method is "effective" in preventing an infection from the HIV virus.

likely than officers to report such changes in behavior; about 54 percent of E1s to E3s and 42 percent of E4s to E6s have changed their sexual behavior, but enlisted personnel are more likely to be single than officers and are more likely to have multiple sexual partners.

In sum, despite substantial knowledge about the means of transmission and prevention of AIDS, enlisted personnel are not well informed. These findings indicate the need to continue and to intensify military educational efforts about AIDS.

10. ALCOHOL AND DRUG ABUSE POLICIES AND PROGRAMS

The Department of Defense has mounted a series of policy directives and programs designed to detect, prevent, and reduce alcohol and drug abuse among military personnel. Programs of the individual Services are consistent with these broad guidelines.

A. Beliefs About Effects of Alcohol and Drug Use Policies

- Personnel in general do not believe that drinking and drug use are broadly accepted norms in the military.

Table 9 presents selected data addressing issues of acceptability and effects of alcohol and drug use. As shown, about one-fourth of military personnel believe that drinking is part of being in the military, while nearly a third believe that everyone is encouraged to drink at social functions at their installation. Other data not shown in the table indicate that about one-tenth believe that it is easy to use drugs at their installation's social functions. Thus, a majority of personnel believe that alcohol and drug use are not accepted norms in the military.

- Most personnel are aware of the health risks associated with alcohol and drug use, but fewer believe that present levels of use interfere with military readiness.

A majority of military personnel are aware of the health risks posed by alcohol and drug use and are more likely to believe that drug use than alcohol use interferes with work. Less than half believe that alcohol and drug use has reduced the readiness of their units.

- Military personnel in general perceive military regulatory policies to be effective in limiting accessibility and ease of use.

About one-fifth of military personnel believe that happy hours make drinking easy at their installation (Table 9), while almost one-half believe that alcoholic beverages are too expensive.

B. Treatment and Barriers to Seeking Help

- About 9 percent of military personnel report receiving counseling or treatment for an alcohol-related problem and 2 percent for a drug-related problem.

Both alcohol and drug abuse counseling and treatment were more likely provided through a military treatment program than through military medical facilities or civilian facilities.

- Military personnel perceive a number of barriers to seeking help for alcohol- and drug-related problems.

The major barrier to seeking treatment for an alcohol or drug problem is the belief that disciplinary action will be taken against the person

Table 9. Beliefs About Acceptability and Effects of Alcohol and Drug Use, Regulatory Policies, and Urinalysis Testing

Beliefs/Items	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Acceptability and Effects of Use</u>					
Drinking is part of being in the military	25.9 (1.0)	26.2 (1.4)	26.3 (1.8)	26.7 (0.9)	26.2 (0.6)
It's easy to use drugs at parties or social functions at this installation	13.0 (1.2)	11.5 (2.3)	12.7 (1.1)	4.6 (0.4)	10.0 (0.8)
Heavy drinking reduces the readiness of my unit	47.9 (1.5)	45.5 (1.8)	43.1 (1.9)	34.3 (0.9)	42.7 (0.8)
Drug use reduces the readiness of units at this installation	38.4 (1.1)	33.4 (0.9)	40.4 (2.3)	23.8 (0.7)	32.8 (0.6)
Drinking will interfere with my health or physical fitness	79.2 (0.8)	80.2 (0.8)	78.9 (2.6)	77.8 (0.8)	79.0 (0.5)
Using drugs would interfere with my health or physical fitness	81.9 (0.7)	85.0 (1.3)	86.3 (1.0)	85.1 (0.9)	84.1 (0.5)
<u>Regulatory Policies</u>					
Happy hours at this installation make drinking easy	20.9 (1.0)	22.5 (1.7)	23.3 (1.4)	25.3 (0.9)	22.9 (0.6)
Driving on base while intoxicated is a sure way to get arrested	91.5 (0.7)	88.3 (0.9)	92.2 (2.2)	92.6 (0.7)	91.0 (0.5)
<u>Urinalysis Testing</u>					
Reduces drug use in the military	74.9 (1.1)	80.7 (1.9)	80.0 (2.7)	71.4 (0.9)	75.9 (0.7)
Tests are reliable	43.6 (0.9)	44.1 (1.3)	43.2 (3.0)	35.1 (0.9)	41.2 (0.6)
Emphasis on detection and discipline in my Service's drug program hurts morale	17.0 (0.8)	17.2 (3.5)	15.5 (1.5)	10.2 (0.7)	14.9 (1.1)

Note: Entries are percentages who "agreed" or "strongly agreed" with the item. Standard errors appear in parentheses.

seeking treatment (58 percent for an alcohol problem, 61 percent for a drug problem), followed by the belief that the commander will find out (43 percent, 49 percent), and the belief that seeking help will damage one's career (30 percent, 44 percent). Less important were beliefs about surprise searches and difficulty in getting off duty to attend sessions.

C. Urinalysis Testing Program

- Most personnel believe that urinalysis testing is an effective deterrent to drug use, but a majority also believe that the reliability of the test is questionable.

As shown in Table 9, about 76 percent of military personnel believe that urinalysis testing has reduced drug use in the military, and 85 percent believe that it has not hurt morale. Only 41 percent believe that the tests are reliable. Twenty-three percent state that urinalysis tests have kept them from using drugs (data not shown in Table 9).

In sum, military policies and programs appear to be effective in creating an environment conducive to responsible alcohol use and nonuse of drugs. Personnel are generally aware of the health risks of alcohol and drug use and are moderately aware of the potential effects on job performance and combat readiness. The urinalysis program appears to be an especially effective component of the drug abuse prevention program, but the risks of alcohol and drug use and effects on job performance need to be intensified in educational programs. More attention needs to be paid to any barriers, either real or perceived, to seeking help.

11. HEALTH PROMOTION IN THE MILITARY: A SUMMARY

The Department of Defense aims to improve and maintain military readiness and the quality of life of DoD personnel through its policy on health promotion. Six broad program areas are included in the health promotion policy: alcohol and drug abuse prevention, smoking prevention and cessation, physical fitness, nutrition, stress management, and hypertension prevention. In addition, the military seeks to inform personnel about the means of transmission and prevention of AIDS. Findings from the 1988 Worldwide Survey indicate significant progress toward each of these aims.

A. Alcohol and Drug Abuse Prevention

Policy. The military aims to prevent the misuse of alcohol and other drugs, eliminate the illegal use of such substances, provide counseling or rehabilitation to abusers who desire assistance, and provide education to various target audiences about the risks associated with drinking.

Findings. Military policy and programs directed toward alcohol and drug abuse prevention are clearly resulting in decreased alcohol and drug misuse among military personnel. Drug use is now at minimal levels, and alcohol use has declined substantially, particularly in the past several years as military efforts against alcohol abuse have been intensified. Alcohol and drug use and associated negative effects are the lowest since 1980 when the survey series began. Military educational programs appear to be creating an environment conducive to responsible alcohol use and nonuse of drugs. Urinalysis is an especially effective component of the strategy for preventing and eliminating drug abuse.

Needs. Despite progress, greater emphasis could be placed on informing military personnel about the risks of alcohol and drug use and their impact on military readiness and job performance as well as on decreasing the perceived barriers to seeking help for alcohol and drug problems. The continuing levels of heavy alcohol use suggest the need for intensification of military efforts to prevent alcohol abuse.

B. Smoking Prevention and Cessation

Policy. The military aims to create a social environment that supports abstinence and discourages use of tobacco products, creates a healthy working environment, and provides smokers with encouragement and professional assistance in quitting.

Findings. The percentages of military personnel who were smokers and heavy smokers declined significantly between 1980 and 1988, particularly during the latter part of the period when military efforts to decrease smoking were intensified. The use of smokeless tobacco declined slightly over the last 3 years. The "no smoking" policy instituted 2 years ago appears to have encouraged many cigarette smokers to quit smoking.

Needs. Despite these improvements, 40.9 percent of military personnel remain smokers and 22.9 percent are heavy smokers. This finding suggests the need for an intensification of military antismoking educational efforts and enforcement of smoking policies.

C. Physical Fitness

Policy. Physical fitness programs aim to encourage and assist all target populations to establish and maintain the physical stamina and cardiorespiratory endurance necessary for better health and a more productive lifestyle.

Findings. Most health indicators show that military personnel are in good health and that many military personnel engage in sound health practices.

Needs. Although these findings are indicative of a good health status and good health practices among military personnel, regular cardiorespiratory exercise should receive greater emphasis.

D. Nutrition

Policy. Nutrition programs aim to encourage or assist target populations to establish and maintain dietary habits contributing to good health, disease prevention, and weight control.

Findings. Almost 80 percent of military personnel have taken some action within the past year to improve their nutrition. About half are eating more high fiber foods, eating fewer calories to lose weight, eating fewer foods with high fat content, and cutting down on the amount of fried foods.

Needs. These findings indicate that military personnel are aware of the role of nutrition in health and are willing to take action to improve health.

E. Stress Management

Policy. The military seeks to reduce environmental stressors, particularly within the work setting, and help target populations cope with stress.

Findings. Almost 80 percent of military personnel report that they are under some stress at work, and 22 percent report they are under a great deal of stress. Many engage in functional stress management techniques, although others engage in less functional activities.

Needs. These findings suggest the need for additional advice on stress management techniques as well as an evaluation and possible attempts to reduce the amount of stress at work.

F. Hypertension Prevention

Policy. The military seeks to identify hypertension early, provide information regarding control and lifestyle factors, and provide treatment referral where indicated.

Findings. Almost all military personnel report having their blood pressure checked within the past year, but only about one-half know what

their blood pressure readings were. About 12 percent have been diagnosed as hypertensive, and about 4 percent are taking medication.

Needs. The relative lack of awareness about their blood pressure readings suggests military personnel need further education about hypertension and its prevention.

G. AIDS Awareness

Policy. The military provides information to its members about the means of transmission and prevention of AIDS.

Findings. Most military personnel know about the means of transmission and prevention of AIDS. There are some misconceptions about these issues, however, particularly the transmission of AIDS through blood transfusion and donation and nonpersonal contact.

Needs. Although most military personnel know the major risk factors for the transmission of AIDS and actions that will prevent transmission, the misperceptions suggest the need for continuing educational efforts.

Findings from the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel indicate substantial progress in the reduction of substance use and the promotion of health during the 1980s. Despite this progress, additional efforts in substance abuse prevention and health promotion are needed. Findings suggest the need to continue the military's effective approach to drug abuse prevention, to intensify efforts to prevent alcohol abuse and smoking, and to promote health practices supportive of good health.

REFERENCES

- Bray, R.M., Guess, L.L., Mason, R.E., Hubbard, R.L., Smith, D.G., Marsden, M.E., & Rachal, J.V. (1983). 1982 Worldwide Survey of Alcohol and Non-medical Drug Use Among Military Personnel (RTI/2317/01-01F). Research Triangle Park, NC: Research Triangle Institute.
- Bray, R.M., Marsden, M.E., Guess, L.L., Wheelless, S.C., Iannacchione, V.G., & Keesling, S.R. (1988). 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel (RTI/4000/06-02FR). Research Triangle Park, NC: Research Triangle Institute.
- Bray, R.M., Marsden, M.E., Guess, L.L., Wheelless, S.C., Pate, D.K., Duntelman, G.H., & Iannacchione, V.G. (1986). 1985 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel (RTI/3306/06-02FR). Research Triangle Park, NC: Research Triangle Institute.
- Burt, M.A., Biegel, M.M., Carnes, Y., & Farley, E.C. (1980). Worldwide Survey of Nonmedical Drug Use and Alcohol Use Among Military Personnel: 1980. Bethesda, MD: Burt Associates, Inc.
- Marsden, M.E., Bray, R.M., & Herbold, J.R. (1988). Substance use and health among U.S. military personnel. Findings from the 1985 Worldwide Survey. Preventive Medicine, 17, 366-376

APPENDIX A
SUPPLEMENTARY TABLES

Table A.1. Trends in Alcohol Use, Past 30 Days, 1980-88

Service/Measure	Year of Survey			
	1980	1982	1985	1988
<u>Army</u>				
Ethanol Ounces	1.61 (0.10) ^b	1.58 (0.08)	1.38 (0.12)	1.14 (0.06)
Drinking Level				
Abstainer	15.6 (0.7) ^a	11.7 (0.5) ^c	14.9 (0.7) ^d	17.1 (0.7)
Infrequent/Light	14.5 (1.0) ^{a, b}	18.0 (0.9)	17.8 (1.1)	18.5 (1.1)
Moderate	32.1 (1.2)	29.8 (1.1)	29.3 (1.4)	31.7 (1.0)
Moderate/Heavy	23.9 (0.7)	25.1 (1.0)	23.9 (1.5)	22.2 (0.8)
Heavy	14.0 (1.1) ^b	15.5 (1.0)	14.1 (1.6)	10.5 (0.9)
<u>Navy</u>				
Ethanol Ounces	1.64 (0.12) ^b	1.64 (0.12)	1.33 (0.10) ^d	0.92 (0.06)
Drinking Level				
Abstainer	10.0 (0.5) ^b	10.5 (1.4)	9.6 (0.8) ^d	15.7 (0.6)
Infrequent/Light	13.0 (0.7) ^{a, b}	21.6 (2.3)	19.9 (1.9)	19.3 (1.1)
Moderate	32.8 (1.9) ^a	25.5 (1.3) ^c	29.8 (1.0)	32.4 (1.4)
Moderate/Heavy	26.0 (1.0)	26.4 (0.4)	28.5 (1.1)	26.1 (3.2)
Heavy	18.2 (2.0) ^b	16.1 (2.6)	12.2 (1.0) ^d	6.5 (1.4)
<u>Marine Corps</u>				
Ethanol Ounces	1.75 (0.09) ^{a, b}	1.45 (0.09)	1.47 (0.22)	1.25 (0.13)
Drinking Level				
Abstainer	10.5 (1.0) ^b	13.5 (2.0)	10.8 (2.5) ^d	18.0 (0.9)
Infrequent/Light	12.1 (0.8)	13.4 (1.9)	14.0 (1.7)	17.1 (3.2)
Moderate	30.7 (1.4)	27.3 (1.0)	28.9 (1.1)	27.1 (1.5)
Moderate/Heavy	28.3 (1.7)	29.4 (1.5)	31.0 (2.2)	26.1 (3.5)
Heavy	18.3 (1.3) ^b	16.4 (0.8)	15.4 (3.3)	11.7 (1.0)
<u>Air Force</u>				
Ethanol Ounces	1.08 (0.11) ^b	0.96 (0.05)	0.86 (0.07)	0.72 (0.03)
Drinking Level				
Abstainer	15.0 (1.0)	12.6 (0.6) ^c	15.8 (1.0) ^d	18.5 (0.8)
Infrequent/Light	15.6 (0.6) ^{a, b}	19.1 (1.0)	17.7 (1.0)	20.0 (0.8)
Moderate	37.3 (0.9) ^{a, b}	34.8 (0.7)	35.1 (0.9)	33.7 (0.8)
Moderate/Heavy	23.1 (0.8)	23.9 (0.8)	23.4 (1.2)	21.7 (1.3)
Heavy	9.0 (0.9) ^b	9.5 (0.7)	8.0 (0.9)	6.1 (0.5)
<u>Total DoD</u>				
Ethanol Ounces	1.48 (0.07) ^b	1.41 (0.05) ^c	1.22 (0.06) ^d	0.96 (0.03)
Drinking Levels				
Abstainer	13.4 (0.5) ^{a, b}	11.8 (0.5) ^c	13.4 (0.6) ^d	17.2 (0.4)
Infrequent/Light	14.1 (0.5) ^{a, b}	18.9 (0.8)	17.9 (0.7)	19.0 (0.8)
Moderate	33.6 (0.8) ^{a, b}	29.8 (0.6)	31.1 (0.7)	32.1 (0.6)
Moderate/Heavy	24.6 (0.5)	25.5 (0.5)	25.6 (0.7)	23.5 (1.1)
Heavy	14.1 (0.9) ^a	14.0 (0.8)	11.9 (0.8) ^d	8.2 (0.6)

Note: Entries for Ethanol Ounces are the average (mean) number of ounces consumed daily. Entries for Drinking Levels are percentages. Standard errors in parentheses.

^aComparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

^bComparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

^cComparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^dComparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table A.2. Alcohol Use by Pay Grade, Past 30 Days

Pay Grade/ Alcohol Measure	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>E1-E3</u>					
Ethanol ounces	1.97 (0.20)	1.39 (0.15)	1.79 (0.18)	0.90 (0.08)	1.47 (0.08)
Heavy drinkers	18.9 (2.1)	7.7 (2.9)	15.8 (1.2)	8.6 (1.9)	12.3 (1.3)
<u>E4-E6</u>					
Ethanol ounces	1.21 (0.07)	0.90 (0.04)	1.02 (0.16)	0.74 (0.04)	0.97 (0.03)
Heavy drinkers	12.2 (1.1)	7.2 (1.7)	11.3 (2.1)	6.9 (0.8)	9.1 (0.8)
<u>E7-E9</u>					
Ethanol ounces	0.69 (0.05)	0.62 (0.05)	0.70 (0.08)	0.63 (0.03)	0.65 (0.03)
Heavy drinkers	4.9 (0.7)	5.8 (1.1)	6.1 (1.5)	5.1 (0.7)	5.3 (0.5)
<u>W1-W4</u>					
Ethanol ounces	0.52 (0.07)	0.58 (0.08)	0.45 (0.03)	* (*)	0.52 (0.05)
Heavy drinkers	4.6 (1.4)	3.5 (1.5)	6.6 (1.3)	* (*)	4.6 (1.1)
<u>O1-O3</u>					
Ethanol ounces	0.43 (0.05)	0.48 (0.05)	0.63 (0.11)	0.53 (0.05)	0.49 (0.03)
Heavy drinkers	1.3 (0.5)	2.2 (0.9)	4.4 (2.4)	1.8 (0.7)	1.9 (0.4)
<u>O4-O10</u>					
Ethanol ounces	0.52 (0.07)	0.52 (0.08)	0.65 (0.07)	0.52 (0.02)	0.52 (0.03)
Heavy drinkers	1.0 (0.5)	1.3 (0.5)	0.6 (0.6)	2.1 (0.8)	1.4 (0.4)
<u>Total</u>					
Ethanol ounces	1.14 (0.06)	0.92 (0.06)	1.25 (0.13)	0.72 (0.03)	0.96 (0.03)
Heavy drinkers	10.5 (0.9)	6.5 (1.4)	11.7 (1.0)	6.1 (0.5)	8.2 (0.6)

Note: Average daily ethanol ounces are mean scores and heavy drinkers are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

Table A.3. Trends in Any Drug Use, 1980-88

Service/ Time Period	Year of Survey			
	1980	1982	1985	1988
<u>Army</u>				
Past 30 days	30.7 (2.8) ^b	26.2 (1.8) ^c	11.5 (1.3) ^d	6.9 (0.7)
Past 12 months	39.4 (2.9) ^{a,b}	32.4 (1.8) ^c	16.6 (1.3) ^d	11.8 (1.1)
<u>Navy</u>				
Past 30 days	33.7 (2.1) ^{a,b}	16.2 (2.2) ^c	10.3 (1.7) ^d	5.4 (0.7)
Past 12 months	43.2 (2.1) ^{a,b}	28.1 (1.7) ^c	15.9 (2.3)	11.3 (2.1)
<u>Marine Corps</u>				
Past 30 days	37.7 (3.0) ^{a,b}	20.6 (2.0) ^c	9.9 (3.2)	4.0 (0.7)
Past 12 months	48.0 (3.1) ^{a,b}	29.9 (3.2) ^c	14.7 (3.8)	7.8 (1.0)
<u>Air Force</u>				
Past 30 days	14.5 (1.1) ^b	11.9 (1.5) ^c	4.5 (0.8) ^d	2.1 (0.4)
Past 12 months	23.4 (1.7) ^{a,b}	16.4 (1.8) ^c	7.2 (0.9) ^d	3.8 (0.6)
<u>Total DoD</u>				
Past 30 days	27.6 (1.5) ^{a,b}	19.0 (1.0) ^c	8.9 (0.8) ^d	4.8 (0.3)
Past 12 months	36.7 (1.5) ^{a,b}	26.6 (1.0) ^c	13.4 (1.0) ^d	8.9 (0.8)

Note: Entries are percentages with standard errors in parentheses. Any drug use is defined as nonmedical use one or more times of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines, stimulants, tranquilizers, barbiturates, sedatives, heroin/other opiates, analgesics, inhalants, or "designer drugs."

^aComparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

^bComparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

^cComparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^dComparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table A.4. Any Drug Use by Pay Grade During Past 30 Days and Past 12 Months

Pay Grade/ Period of Use	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>E1-E3</u>					
Past 30 Days	16.0 (2.7)	9.7 (0.8)	6.5 (0.8)	3.2 (0.9)	8.9 (0.9)
Past 12 Months	28.4 (2.9)	24.0 (3.6)	10.5 (1.4)	6.2 (1.4)	17.6 (1.8)
<u>E4-E6</u>					
Past 30 Days	7.1 (0.7)	5.7 (1.0)	3.4 (1.1)	2.4 (0.6)	5.1 (0.4)
Past 12 Months	11.8 (1.2)	10.9 (1.6)	8.9 (1.4)	4.2 (1.0)	9.1 (0.7)
<u>E7-E9</u>					
Past 30 Days	1.3 (0.4)	1.2 (0.2)	0.6 (0.4)	0.8 (0.2)	1.1 (0.2)
Past 12 Months	2.2 (0.5)	1.6 (0.3)	0.9 (0.6)	1.6 (0.3)	1.8 (0.2)
<u>W1-W4</u>					
Past 30 Days	1.3 (0.6)	0.3 (0.2)	2.5 (2.3)	* (*)	1.2 (0.5)
Past 12 Months	1.5 (0.6)	0.8 (0.5)	2.5 (2.3)	* (*)	1.5 (0.5)
<u>O1-O3</u>					
Past 30 Days	2.4 (0.8)	0.8 (0.6)	** (**)	0.7 (0.3)	1.2 (0.3)
Past 12 Months	4.2 (0.8)	1.6 (1.3)	0.4 (0.4)	0.7 (0.3)	2.0 (0.4)
<u>O4-O10</u>					
Past 30 Days	0.9 (0.4)	1.3 (0.7)	0.7 (0.6)	1.2 (0.5)	1.1 (0.3)
Past 12 Months	1.2 (0.4)	1.3 (0.7)	0.7 (0.6)	1.4 (0.5)	1.2 (0.3)
<u>Total</u>					
Past 30 Days	8.9 (0.7)	5.4 (0.7)	4.0 (0.7)	2.1 (0.4)	4.8 (0.3)
Past 12 Months	11.8 (1.1)	11.3 (2.1)	7.8 (1.0)	3.8 (0.6)	8.9 (0.8)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Any drug use refers to nonmedical use one or more times of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, inhalants, or "designer" drugs.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.

Table A.5. Trends in Cigarette Smoking, Past 30 Days, 1980-88

Service/ Level of Use	Year of Survey			
	1980	1982	1985	1988
<u>Army</u>				
Any smoking	54.3 (0.7) ^b	54.7 (1.8)	52.0 (1.8) ^d	43.1 (1.1)
Heavy smoking	35.2 (0.7) ^b	34.6 (1.4)	33.6 (1.4) ^d	22.8 (0.7)
<u>Navy</u>				
Any smoking	53.8 (1.2) ^b	55.4 (1.0) ^c	47.9 (1.2)	43.8 (1.8)
Heavy smoking	37.3 (1.3) ^b	35.7 (1.4)	34.8 (1.6) ^d	24.6 (2.0)
<u>Marine Corps</u>				
Any smoking	53.4 (0.6) ^{a,b}	48.7 (0.4)	42.6 (3.1)	41.3 (1.8)
Heavy smoking	34.5 (0.9) ^{a,b}	31.6 (0.7) ^c	26.1 (0.8) ^d	18.7 (2.2)
<u>Air Force</u>				
Any smoking	43.2 (1.8) ^b	44.1 (1.6)	39.0 (2.3)	35.8 (1.2)
Heavy smoking	29.7 (1.3) ^b	30.6 (1.2)	26.8 (1.7) ^d	22.0 (0.8)
<u>Total DoD</u>				
Any smoking	51.0 (0.8) ^b	51.4 (0.8) ^c	46.2 (1.0) ^d	40.9 (0.8)
Heavy smoking	34.2 (0.6) ^b	33.5 (0.7) ^c	31.2 (0.8) ^d	22.7 (0.7)

Note: Entries are percentages with standard errors in parentheses. Heavy smoking is defined as smoking one or more packs of cigarettes per day.

^aEstimates between 1980 and 1982 are statistically significant at the 95 percent confidence level.

^bEstimates between 1980 and 1988 are statistically significant at the 95 percent confidence level.

^cEstimates between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^dEstimates between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table A.6 Cigarette Use by Pay Grade, Past 30 Days

Pay Grade/ Smoking Measure	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>E1-E3</u>					
Any smoking	45.0 (3.1)	55.3 (3.8)	47.6 (2.8)	38.4 (3.2)	46.3 (2.0)
Heavy smoking	18.4 (1.8)	20.8 (2.3)	15.1 (4.1)	18.8 (2.2)	18.6 (1.2)
<u>E4-E6</u>					
Any smoking	48.4 (1.3)	44.5 (1.5)	42.9 (1.4)	40.4 (1.6)	44.5 (0.8)
Heavy smoking	24.5 (1.2)	26.6 (2.3)	23.5 (2.6)	26.3 (1.0)	25.6 (0.9)
<u>E7-E9</u>					
Any smoking	52.8 (1.5)	48.5 (2.1)	44.6 (1.6)	41.1 (1.2)	47.7 (0.9)
Heavy smoking	39.7 (2.0)	38.8 (1.8)	29.3 (2.8)	31.4 (1.1)	36.3 (1.0)
<u>W1-W4</u>					
Any smoking	31.4 (2.7)	38.5 (3.0)	26.9 (4.0)	* (*)	32.1 (2.2)
Heavy smoking	23.5 (2.5)	32.8 (3.0)	18.5 (6.6)	* (*)	24.5 (2.1)
<u>O1-O3</u>					
Any smoking	18.0 (2.6)	20.8 (2.0)	12.8 (1.4)	17.8 (2.3)	18.2 (1.3)
Heavy smoking	7.3 (1.4)	9.9 (2.8)	6.4 (2.9)	7.2 (2.0)	7.8 (1.1)
<u>O4-O10</u>					
Any smoking	16.3 (1.2)	18.6 (1.8)	13.6 (2.1)	19.5 (2.1)	17.9 (1.0)
Heavy smoking	12.2 (1.3)	13.2 (1.4)	8.8 (1.5)	12.8 (2.1)	12.5 (1.0)
<u>Total DoD</u>					
Any smoking	43.1 (1.1)	43.8 (1.8)	41.3 (1.8)	35.8 (1.2)	40.9 (0.8)
Heavy smoking	22.8 (0.7)	24.6 (2.0)	18.7 (2.2)	22.0 (0.8)	22.7 (0.7)

Note: Estimates are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

Table A.7 Trends in Alcohol-Related Negative Effects
During Past 12 Months by Service, 1980-88

Service/Measure	Year of Survey			
	1980	1982	1985	1988
<u>Army</u>				
Serious consequences	17.9 (1.6) ^b	16.3 (1.2)	13.5 (2.0)	10.3 (0.8)
Productivity loss	23.8 (1.3) ^a	33.1 (0.8) ^c	27.2 (1.3) ^d	22.0 (1.0)
Dependence	8.8 (1.0)	10.1 (0.8)	12.1 (1.5) ^d	7.2 (0.6)
<u>Navy</u>				
Serious consequences	22.1 (2.1) ^b	17.6 (1.4)	13.5 (2.0)	10.4 (1.5)
Productivity loss	34.7 (2.1) ^b	41.8 (1.8) ^c	35.5 (2.4) ^d	26.4 (3.1)
Dependence	9.7 (1.0) ^b	11.6 (1.0) ^c	6.8 (0.8)	7.2 (1.3)
<u>Marine Corps</u>				
Serious consequences	26.2 (2.2) ^{a,b}	19.7 (1.0) ^c	12.3 (1.7)	17.0 (3.4)
Productivity loss	34.1 (1.6)	37.6 (1.2)	29.0 (5.0)	32.0 (3.8)
Dependence	11.8 (1.2) ^b	10.2 (7.8)	7.6 (1.4)	9.8 (1.7)
<u>Air Force</u>				
Serious consequences	9.0 (0.8) ^b	8.0 (0.8)	4.7 (0.5)	3.9 (0.5)
Productivity loss	20.7 (1.2) ^{a,b}	28.0 (2.7)	19.4 (1.1) ^d	15.5 (0.8)
Dependence	4.3 (0.6)	3.7 (0.7)	3.3 (0.5)	3.8 (0.4)
<u>Total DoD</u>				
Serious consequences	17.3 (1.1) ^{a,b}	14.6 (0.6) ^c	10.7 (0.9)	9.0 (0.6)
Productivity loss	26.7 (1.2) ^{a,b}	34.4 (0.7) ^c	27.1 (1.1) ^d	22.1 (1.2)
Dependence	8.0 (0.6) ^b	9.0 (0.5)	7.7 (0.7)	6.4 (0.5)

Note: Entries are percentages with standard errors in parentheses.

^aComparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

^bComparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

^cComparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^dComparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table A.8 Alcohol-Related Negative Effects During Past 12 Months,
by Pay Grade

Measure/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Serious Consequences</u>					
E1-E3	21.2 (2.7)	18.4 (2.8)	26.6 (6.6)	8.2 (1.8)	17.5 (1.8)
E4-E6	11.3 (0.8)	10.8 (1.6)	15.5 (1.8)	3.9 (0.5)	9.3 (0.7)
E7-E9	3.8 (0.6)	2.5 (0.6)	3.2 (1.0)	1.6 (0.3)	2.7 (0.3)
W1-W4	1.6 (0.6)	1.3 (0.8)	1.2 (1.2)	* (*)	1.5 (0.5)
O1-O3	2.1 (0.6)	3.3 (1.3)	1.6 (0.9)	0.3 (0.3)	1.6 (0.4)
O4-O10	0.3 (0.3)	2.0 (0.9)	0.5 (0.6)	0.9 (0.4)	1.0 (0.3)
<u>Productivity Loss</u>					
E1-E3	33.9 (2.2)	35.0 (4.2)	40.7 (5.3)	24.5 (1.5)	32.6 (1.7)
E4-E6	24.6 (1.4)	27.8 (3.7)	32.6 (2.6)	14.4 (1.3)	23.1 (1.5)
E7-E9	10.9 (1.0)	13.2 (0.9)	10.6 (1.1)	10.0 (0.9)	11.2 (0.6)
W1-W4	9.6 (2.2)	13.0 (2.3)	18.7 (2.7)	* (*)	10.9 (1.7)
O1-O3	11.7 (1.7)	19.2 (4.4)	20.6 (7.1)	12.7 (0.9)	14.4 (1.3)
O4-O10	8.3 (2.2)	13.7 (3.5)	11.2 (2.2)	10.3 (1.0)	10.5 (1.2)
<u>Dependence</u>					
E1-E3	19.7 (2.2)	12.2 (2.0)	15.8 (1.2)	7.4 (1.2)	13.4 (0.9)
E4-E6	6.7 (0.5)	7.7 (1.4)	7.7 (2.2)	3.9 (0.5)	6.3 (0.5)
E7-E9	2.0 (0.4)	2.1 (0.3)	2.8 (1.1)	1.4 (0.3)	1.9 (0.2)
W1-W4	1.7 (0.8)	2.3 (0.9)	1.2 (1.2)	* (*)	1.8 (0.7)
O1-O3	0.9 (0.3)	1.5 (1.1)	1.3 (0.9)	0.4 (0.2)	0.9 (0.3)
O4-O10	0.3 (0.2)	0.6 (0.3)	2.0 (1.0)	1.0 (0.7)	0.7 (0.3)

Note: Entries are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

Table A.9. Trends in Drug-related Negative Effects During Past 12 Months by Service, 1980-88

Service/Measure	Year of Survey			
	1980	1982	1985	1988
<u>Army</u>				
Serious consequences	14.4 (1.4) ^{a,b}	8.0 (0.7) ^c	3.9 (0.7)	2.7 (0.4)
Productivity loss	15.7 (1.7) ^b	13.1 (1.2) ^c	4.4 (0.8) ^d	2.4 (0.4)
<u>Navy</u>				
Serious Consequences	17.2 (2.1) ^{a,b}	7.4 (0.9) ^c	4.0 (1.0)	2.4 (0.5)
Productivity Loss	18.8 (2.0) ^{a,b}	11.3 (0.9) ^c	3.9 (1.1)	3.1 (1.3)
<u>Marine Corps</u>				
Serious Consequences	19.4 (2.1) ^{a,b}	7.2 (1.1)	3.9 (2.2)	1.9 (0.5)
Productivity Loss	20.8 (2.1) ^{a,b}	8.9 (0.8)	4.3 (3.0)	3.0 (0.9)
<u>Air Force</u>				
Serious Consequences	6.1 (0.6) ^{a,b}	2.2 (0.3) ^c	0.9 (0.2) ^d	0.3 (0.1)
Productivity Loss	6.4 (0.7) ^{a,b}	4.5 (0.5) ^c	1.5 (0.7)	0.4 (0.1)
<u>Total DoD</u>				
Serious Consequences	13.3 (1.0) ^{a,b}	6.2 (0.4) ^c	3.0 (0.4) ^d	1.8 (0.2)
Productivity Loss	14.4 (1.1) ^{a,b}	9.9 (0.5) ^c	3.4 (0.6)	2.1 (0.4)

Note: Entries are percentages with standard errors in parentheses.

^aComparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

^bComparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

^cComparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^dComparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table A.10. Drug-Related Negative Effects, During Past 12 Months
by Pay Grade

Measure/ Pay Grade	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
<u>Serious Consequences</u>										
E1-E3	9.9	(2.0)	6.2	(1.3)	3.4	(0.6)	0.3	(0.2)	5.0	(0.7)
E4-E6	1.9	(0.3)	1.9	(0.4)	1.4	(0.5)	0.5	(0.2)	1.5	(0.2)
E7-E9	0.4	(0.1)	0.3	(0.1)	0.3	(0.3)	**	(**)	0.3	(0.1)
W1-W4	0.1	(0.1)	**	(**)	**	(**)	*	(*)	0.1	(0.1)
O1-O3	0.2	(0.2)	**	(**)	**	(**)	**	(**)	0.1	(0.1)
O4-O10	0.1	(0.1)	0.3	(0.3)	**	(**)	**	(**)	0.1	(0.1)
<u>Productivity Loss</u>										
E1-E3	8.3	(2.4)	7.7	(3.2)	3.6	(0.6)	0.3	(0.2)	5.0	(1.3)
E4-E6	1.9	(0.4)	2.7	(0.8)	4.0	(2.0)	0.6	(0.2)	1.9	(0.3)
E7-E9	0.2	(0.1)	0.2	(0.1)	0.3	(0.3)	0.1	(0.1)	0.2	(0.1)
W1-W4	**	(**)	**	(**)	**	(**)	*	(*)	**	(**)
O1-O3	**	(**)	**	(**)	**	(**)	**	(**)	**	(**)
O4-O10	0.1	(0.2)	0.3	(0.3)	**	(**)	**	(**)	0.1	(0.1)

Note: Entries are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.